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ABSTRACT

Ten environmental education booklets presented in this document are the third volume of the environmental series developed by community groups around the Tallahassee Junior Museum and its Pioneer Farm. The first three booklets present an overview of the museum and of the various education programs and activities offered for students at the museum and farm. Animals are discussed in detail in the next unit, developed by the Florida Audubon Chapter. Another unit fosters creativity in environmental education while also developing human behavior. Other units present helpful hints for growing plants and herbs, and include information on environmental excursions; developing reading competency in environmental education; environmental and behavioral feelings; and energy and environment learning activities for camp and home. These materials augment those found in Volumes I and II (ED 100 734 and SO 008 187). (JR)

# WAYS—

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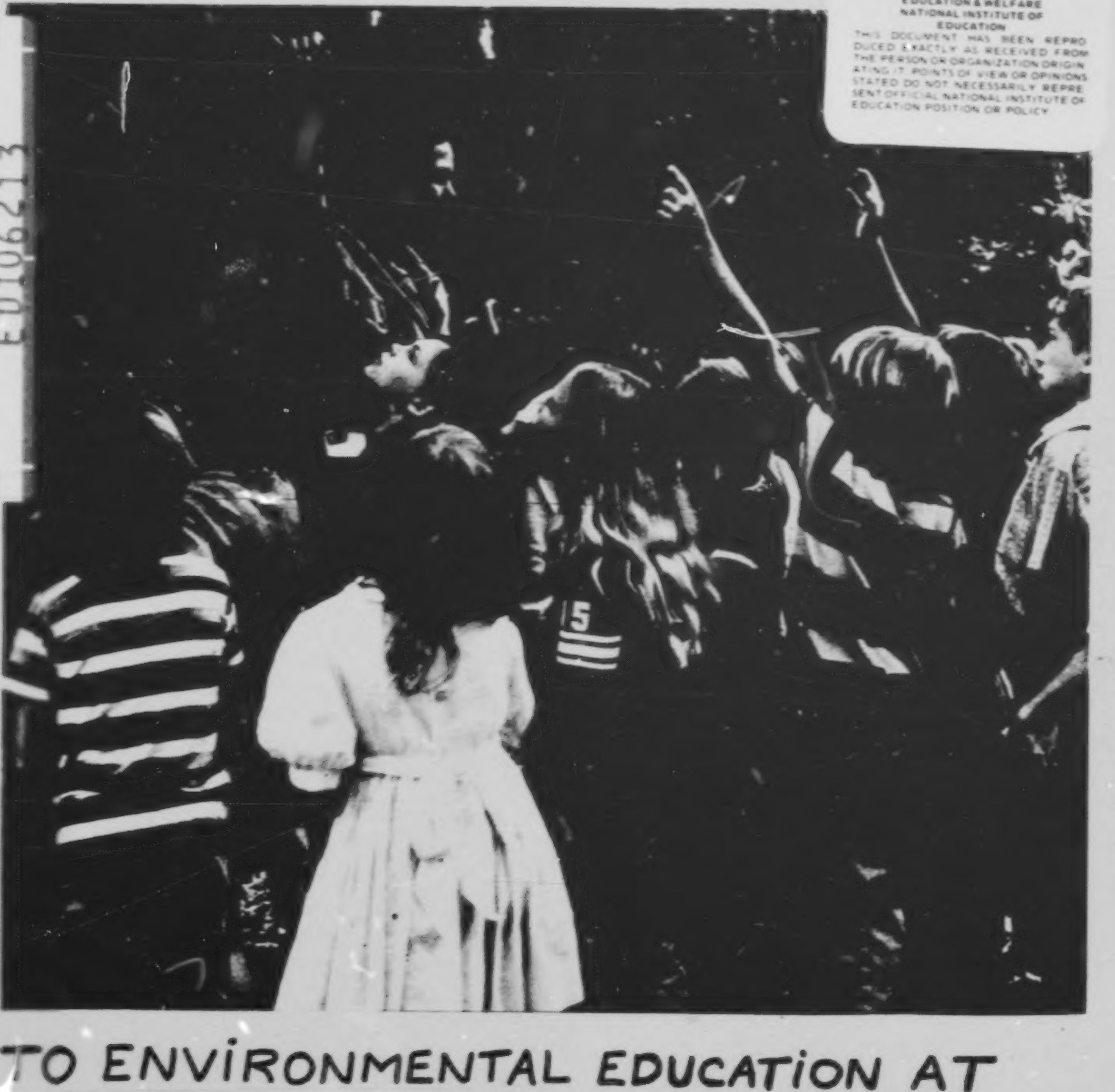

# TO ENVIRONMENTAL EDUCATION AT THE TALLAHASSEE JUNIOR MUSEUM

# COMMUNITY LEADERS' TRAINING IN ENVIRONMENTAL STUDIES

July, 1974 - to June, 1975

A CO-OPERATIVE COMMUNITY PROJECT FUNDED UNDER TITLE I
OF THE HIGHER EDUCATION ACT OF 1965

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The instructional materials and activities printed in each of the thirty booklets in this series are the outgrowth of one-week workshops conducted at the Tallahassee Junior Museum. The suggested activities are those of the participants, the project staff, and occasional consultants. The activities are printed and distributed to help environmental educators in a wide variety of community settings and to foster others' creativity. The activities presented and the positions taken on environmental issues represent the views of the authors and not the agencies, groups, and institutions which they represent.

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# WAYS TO ENVIRONMENTAL EDUCATION

## Volume III

Edited by:

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May 1975
The Florida State University

## INTRODUCTION

Environmental education is largely recognized as existing in both formal and non-formal educational settings. Environmental educators have, for the most part, concentrated their efforts within formal education sectors-K through university-and have neglected the many opportunities for public educational adventures where community resources can provide tremendous "ways for environmental education" to happen.

In an effort to exploit this potential, the Environmental Education Project at Florida State University developed a proposal funded under Title I of the Higher Education Act of 1965 designed to glean ideas from active members of the community. The proposal "Adult Community Leaders Training in Environmental Studies" produced a series of booklets containing the ideas, activities and approaches these community groups took in educating their membership or target groups about the environment. Two volumes, each with ten booklets, have been produced. This volume contains ten more of these booklets written by community groups. Current plans call for at least one more volume to be produced.

Materials written by participating groups were distributed by those groups and by the project staff. This insured the "ways" reached the target audience as well as other interested and involved environmental educators. Many of the project materials have been reproduced by school districts and private organizations such as the Girl Scouts and the Audubon Society.

We began this project with a feeling that people were the most poorly utilized environmental education resource in Florida. This project has reinforced that feeling. The "ways" booklets provide the proof. People outside of the formal educational sector have ideas ... good ideas.

If educators are willing to involve people, listen to their ideas, and work with them to develop some structure, many more "ways" to environmental education can be discovered.

R. F. A.
D. L.
J. D.

Tallahassee, 1975

# tallahassee
# junior
# museum

Helen Grissett
Sam W. Kates
Ann Matthews

"This is the only Museum in the United States where the exhibits indoors are challenged by the outdoors."

--John Ripley Forbes, President
Natural Science for Youth
Foundation

## I. HISTORY OF THE TALLAHASSEE JUNIOR MUSEUM

### A. Who Started The Museum?

Movement for a Junior Museum in Tallahassee was started by the Tallahassee chapter of the Association for Childhood Education. The project was given sponsorship as its main project by the Service League of Tallahassee (now the Junior League of Tallahassee). During 1958, support was provided by the National Foundation for Junior Museums (now the Natural Science for Youth Foundation). This support included a monetary contribution toward a director's salary.

### B. Why Was It Started?

When the Tallahassee Junior Museum was first conceived in thought, the only other Junior Museums in Florida were in Miami and Jacksonville. The group of school teachers desiring to make this progressive step wanted to give the youth of Tallahassee a better understanding and appreciation of natural science, the social sciences, history and the world in which they live. They felt that the educational resources of Tallahassee (such as the universities, the museums, and certain state agencies) could be drawn upon and geared to the educational needs of the children.

### C. When Was It Started?

In 1957 two hundred dollars was contributed by the Tallahassee chapter of the Association for Childhood Education for the drawing of a charter and incorporation. In 1958 the present Junior League of Tallahassee and present Natural Science for Youth Foundation gave their financial support. During the same year the Florida State Cabinet gave the Museum temporary quarters in a former residence in the Capital Center. In 1960 a ten acre tract on Lake Bradford, Leon County, was bought, and the present buildings on this site were ready for official use on March 24, 1962.

## II. THE PHYSICAL PLANT OF THE MAIN MUSEUM BUILDINGS

### A. Who Were The Architects And How Were They Selected?

James D. Bullard and Dan P. Branch were selected from 11 entries in a local architects' competition. (Of the 125 Junior Museums in the United States, only about 25% are housed in buildings designed particularly for them, according to John Ripley Forbes, President of the Natural Science for Youth Foundation).

### B. What Is The Reason For The Unusual Design And Lay-Out Of The Buildings?

James Bullard says of the design, a series of four units connected by covered walkways: "Basically, the approach to designing the Tallahassee Junior Museum was a recollection of youth and an attempt to recapture the enthusiasm, complex simplicity and happiness of that period of our lives. A frequent comment of the observer is on the shape of the roofs. This upsweeping form was chosen to convey an atmosphere of happiness and give the composition a feeling of playfulness. The rhythmic framing members of the walks and platforms are seen against the undefined forms of nature and the solid forms of the buildings; these suggest the many facets and ever changing perspective of youth. If we must select a single word to express the spirit of the Tallahassee Junior Museum, it must be enthusiasm. We believe this word enthusiasm may also define the quality we adults admire and envy in youth."

C. How Much Did The Four Buildings Cost To Construct?

The buildings were built for approximately $8.50 a square foot, and the total cost amounted to $75,041.32.

D. What Are The Various Buildings Used For?

The reception building is used for administrative purposes. In it is the office, reception center, sales corner, reference corner and stage area. Since it is the largest of the buildings, it may also be used for an auditorium. The classroom building is used as an art and science lab, and the natural history and science building is used for bird watching exhibits and instructional purposes. The exhibit building is used for the display of material not relating to natural science. Two of the buildings have basements. One of these is used to house the Treasure Chests (boxed exhibits for loan to schools and other educational groups) and collections, and the other is used for a workshop and additional office space.

E. How Much Land Does The Museum Have?

The original purchase was of a ten acre tract. Within more recent years a 40 acre purchase adjoining the original plot was negotiated, making a total of 50 acres. In 1973, two additional acres were leased from the U.S. Forestry Service.

F. What Are Some Of The Long Range Plans?

In 1971 the Museum Board adopted a ten-year plan. This included alligator, puma, bobcat, and otter natural habitats; a new exhibit building, an education building, and a transportation pavilion; and the acquisition of adjacent property for expansion and for parking.

## III. THE STAFF AND VOLUNTEER HELPERS

A. Museum Director
Museum Curator
Three part-time teachers
Curator of Animals
Bookkeeper
Secretary
Maintenance Man

Maid
Gardener

B. What Organizations Do Volunteer Work At The Museum?

The Junior League of Tallahassee and the Women's Guild of the Tallahassee Junior Museum furnish most of the regular volunteer help. however, other organizations, such as the Tallahassee Garden Clubs and Junior Women's Club have furnished invaluable service.

## IV. FINANCIAL OPERATION OF THE MUSEUM

A. Where Does The Museum Get The Money To Operate?

There are a number of sources of income. 1. Leon County Commission, and 2. The Leon County School Board are the principal tax-base sources. Memberships, admissions, commissary sales and grants from private foundations and Guild activities such as Market Day, Farm Day, Antique Shows, etc. Private foundations have contributed to the operating budget of the Museum, such as the recent grant from the Firman Fund, Cleveland, Ohio. The Museum's capital improvements are made through memorials, special funding programs, gifts, and by income from the Museum's new capital fund.

B. How Are The Buildings To Be Paid For?

In 1960 the Junior League of Tallahassee donated $10,000 to the building fund. Other donations came from Mrs. Udo Fleischmann and from the Phipps Foundation. Citizens of Tallahassee were given the opportunity to make pledges to cover the amount of the building commitment. There remains a small mortgage which is paid on, monthly, from funds allocated to the operating account.

## V. THE BIG BEND PIONEER FARM

A. What Is The Big Bend Pioneer Farm?

Big Bend Pioneer Farm is an authentic restoration of the rural life of approximately ninety years ago in that part of North Florida which still was the frontier south. This farm exhibit is unique in that it was the first full scale historic restoration being carried on by a Junior Museum.

B. How Did The Idea For This Particular Restoration Originate?

When the final selection of plans for the four museum buildings was made, several members of the Board of Trustees were somewhat upset by what they considered the Oriental influence in the roof lines of the buildings. One of the architects insisted that the pagoda-like profile is typical of North Florida pioneer farm buildings, and suggested several places where these log structures might still be seen. Board members not only discovered the upsweeping curve on old Big Bend buildings, they also discovered an entire farmyard of our buildings in one area and a matching log farm house in the next county that could be had for the cost of moving them. And, thus, the Big Bend Pioneer Farm was born.

### C. Where Did The Buildings In The Big Bend Farm Come From?

The farm house, built in the 1880s, was moved from Liberty County near Hosford. The barn with hayloft, buggy house, corn crib and stall, syrup shed, chicken house and fruit and potato house were built at the Frink Community in Calhoun County. The commissary, built in 1898, was moved from an area near Pavo, Georgia. The rice husker, the cane grinder, the butcher pole, birdhouse, and the picket fence enclosing the dooryard of the house are original to the 1880 period and were all found in this area. The only reconstructed buildings are the well and the fittings and the blacksmith shop. The farm area is partially enclosed by the original split rail fence, stakes and riders locked into place.

### D. How Were The Farm House, Commissary, And Other Buildings Moved To Tallahassee?

They were moved in by trucks. In the 1880s yellow pine logs were hand-hewn and fitted together. They were dismantled and carefully re-assembled in Leon County, the out-buildings being placed at suitable locations in relation to the cabin. The commissary, originally used as a commissary for a turpentine camp and built from hard cypress, was also moved by truck.

### E. What Are Some Of The Most Interesting Facts Concerning The Farm House?

The foundation of the building is interesting. It rests on a foundation of skewed blocks made from very hard lumber which had never been turpentined. Originally, the farm house had a kitchen some 20 to 30 feet to the side, connected only by an uncovered walkway. The Museum hopes to acquire an authentic kitchen building or to reconstruct the original structure in its continuing restoration project. The farm house also had three bedrooms (which had been added after its original construction), one on each side porch and one on the left front corner. The fireplace and chimney are of the type known as "stick and mud." Bricks were scarce and expensive for the pioneer of North Florida. The only thing new about the farm house is the new cedar shingle roof, which was necessary in order to protect the household items.

### F. Where Did The Items Inside The Buildings Come From?

Many of them were donated by interested townspeople and area residents. Each building is furnished with appropriate and authentic items.

G. Where Did The Pioneers Who Settled This Area Originally Come From?

The pioneers came from the Carolinas probably in covered wagons. They brought along things that they could not make in the wilderness area. Some of these items are kerosene lamps, candle-makers, window glass, household utensils, and, of course, a shotgun (muzzle loading) to protect the family and to provide game for food. Some trophies of the farmer's hunting skill may be seen in the farm house: the cow hide chairs, the rugs on the floor, the turkey-wing fan on the table, the deer antlers over the outside door, and the antlers over the fireplace complete with turkey beards.

H. The Farm Also Includes A Vegetable Garden And Cash Crops which were raised in the 1880s. The Museum Gardener uses hand-power, employing tools of the period and mule-power --when the mule cooperates.

## VI. SPECIAL BUILDINGS

### A. Murat House

Bellevue was the plantation home (1854-1867) of the Princess Catherine Murat, who was the Great-Grand Niece of George Washington and widow of the Prince of Naples, Achille Murat. The house was moved to its present location and restored and furnished by the Murat House Association which deeded the house over to the Museum in 1973.

### B. School House

This was the last one-room school house in service in the state. The school was established in 1860 in Miccosukee, but this building was from the turn of the century. It was moved to the Museum about five years ago and restored and furnished with the Simmons Memorial.

### C. Sesquicentennial Building

A replica of Florida's first Capitol, a log building, built in celebration of Tallahassee's Sesquicentennial in 1974. The building was constructed by Sheriff Raymond Hamlin, was moved to the Museum with funds from the Tallahassee Lions Club, and now serves as the Welcome Center for the Museum.

### D. Caboose

A 1926 wooden caboose donated by the Seaboard Coast Railroad now houses a series of exhibits on the history of railroading.

## VII. LIVE ANIMALS

A. What Live Animals May Be Seen On The Big Bend Pioneer Farm?

The farm has a pig, mule, goats, sheep, cow and various poultry.

### 3. What Wild Animals Are Displayed?

Plans are being developed to display all of the Museum's wild animals in natural habitats. At the moment habitats have been built for white-tail deer, black bear, waterfowl, fox and raccoon. In addition, skunks, a bobcat, an opossum, rabbits, owls, an eagle, and a hawk may be seen in smaller cages. Several species of Florida snakes and an alligator can be seen in glass cages in the Natural Science Building and several varieties of turtles and tortoise are sheltered in a "turtle pond" near the main building.

## VIII. EDUCATION PROGRAMS

### A. What Are Some Of The Services Offered To The Public And To Groups Of School Children?

The Museum features nine exhibits per year in the main building. These displays involve subjects ranging from arts and crafts to history and the sciences. In many cases the materials for these exhibits are provided by local Tallahassee organizations. In addition, there is a weekly sponsored Museum program featuring a craftsman, musician, natural scientist or film. Both adult and youth organizations use the Museum for meeting places.

### B. Are There Any Items For Loans To Schools?

Over one-hundred treasure chests are available for loan to schools in Leon County. These chests are boxed exhibits which contain information and items of interest on geography, natural science, different cultures and history. Pick up and delivery service is provided for the schools by Leon County Media Center. Another interesting service is the Helen Grissett Animal Lending Library. Small animals may be checked out in a cage to a classroom for a day. In addition, Museum teachers may be "borrowed" to share their expertise with school children, and to conduct classes in the schools.

### C. What Field Classes Are Offered To School Children?

There are field classes offered in four general areas for Grades K-12:

1. Florida History field classes are entitled: Farm Animals, Everyday Life of a Pioneer Child, Old Tallahassee, Farm Family Life, Florida History, and Florida's Schools Days.

2. Environmental field classes utilize the forty-two acres of wet woodland and swamp. The classes are entitled: "Reading Mother Nature," "Our Changing Seasons," "Plant, Animal and People Communities," "The Chain of Life," "The Tree in Your Life," and "Ecology of the Swamp." For secondary schools the field classes are: "A Successful Life," "Friend or Foe," and "Around or Underneath."

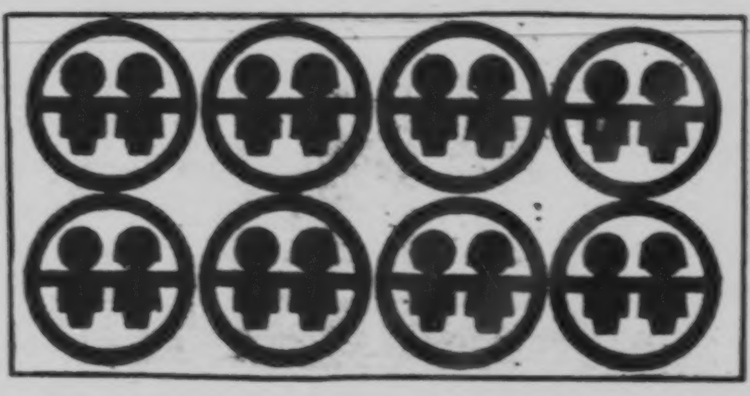
3. Wild animals attract many students each year. The classes deal with adaptations, characteristics and habitats of Florida animals. Classes offered are: "Florida Wildlife," "Animal Classification," "Wildlife Habitats," "Snakes,"

"Insects," "Reptiles," "Birds of North Florida," "Birds of Prey," and "Vanishing Wildlife."

4. Classroom exhibits are designed primarily for elementary and middle school children. They focus on a particular topic and usually are changed every four to six weeks during the school year. The emphasis is placed on student participation. Past exhibits have been: "Spiders," "Christmas in Mexico," "Early Florida Indians," "Oriental Drama," "Under the Sea," etc. In addition, teachers may make arrangements to bring their classes to the Museum's regular exhibits.

5. In the school program special programs in History and Environment, "Life in the 1880s" and "Schoolyard Ecology," are available by special requests from teachers.

6. Special services: Teachers may request special classes in school or at the Museum on subjects that use the Museum's collection and/or the staff's expertise. "The Andes" is a sample special program which has become very popular.



# TRANSCENDING. . . .The Taboo Against Knowing Who You Are

prepared by

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With a little help
from the Project Staff

December, 1974

## I JUST FOR OPENERS

1. List all activities that you observe in the forest. Several of which might be:

    1. Anthill

    2. Trees growing

    3. Birds singing and moving from tree to tree.

    4. Leaves decaying

    Try to determine whether the activities are dependent or independent of each other.

2. Compare the life cycle of the tree with Erik Erikson's theory of life cycle stages. Are they similar or different? How?

3. Suppose you were one of those large oak trees with moss hanging from the branches. How do you think you would feel? Would you want the moss to continue to grow on your branches? Would you want to get rid of it? How would you communicate with other trees? Being a tree, what problem do they have? Suppose you were removed from your habitat (forest), do you think that the tree would be "happy" or "sad?" Why or why not?

4. List five things that are found in the forest that you consider important. Express your feelings about the environments of trees and human beings. How are they related? How are they different?

5. Gather up approximately five things from your environment that you feel are important. When students return have a show and tell period.

6. Discuss what kind of animals might live in the environment you are about to visit. Explain that we are going to share their environment for a while. Each student is to place a sheet, etc. over his/her head and only the area that is under this sheet is now your world. What is there? Does it change? How do you feel about your world? Have them take one other person into their world. How has it changed? How do you now feel about your world? Have students break up into groups of 2-3 and share their experiences - this should not be a forced situation. If students choose not to share this is fine.

7. Before taking the students into the woods, ask them to be intensely aware of every possible thing around them. Trees, shrubs, insects, animals, sounds, colors, etc. But not to look at just the whole-also be aware of textures, sizes, shading, etc.

Once into the woods have the students come together. Have them stand quietly with their eyes closed for two minutes listening to the sounds around them.

Once this is completed have the students go off individually to look for one unusual item in the woods that they never noticed before. After 20 minutes have them come back and describe the item in as full detail as possible.

Have the students discuss the statement: "Sometimes we don't fully see the world around us!" and relate it to the trip in the woods.

8. Before going to the woods prepare a short lecture on the settlement of the area and the hardships involved (pioneers - explorers - settlements, etc.) Before going into the woods tell the students to be intensely aware of everything around them.

After walking through the woods bring the kids together and form a circle facing outward. 2 minutes silent.

Then go to the woods as the pioneers would have gone into the virgin woods looking how to use things in the woods to survive.

9. Which of the animals which you have seen reminds you the most of yourself? Why? (Compare traits, habits, markings, survival skills, etc.)

In our culture we put behind bars those people who we deem "criminals." We do it for the purpose of punishment. Obviously, however, we do not put these animals behind bars for punishment. Yet we do put them in cages in varying sizes and shapes, for the purpose of letting people come by and look at them. Do we "hurt" these animals by putting them in cages? Do we control their freedom? Although animals can not speak for themselves, as an animal (one that you choose) make a case for the necessity of zoos.

10. Find an acorn on the ground. Sit and reflect as you examine it carefully. How is your life like an acorn? How are you like an acorn?

11. Pick up some deer moss. Find a comfortable spot and sit down to examine this ancient life form in your hand. Ask yourself "How is my life like this deer moss?" "How am I related to the life which has gone before me?"

12. Select an oak tree and sit down where you can see it well and yet be comfortable. This is a time for analogies. How is your life like this oak tree? How is a "healthy personality" like this oak tree? How is "loyalty" like this oak tree?

13. Find a fire ant nest (hill). Without disturbing the nest and being careful not to be "stung," observe the ants at work. What do you see? How are we human beings like those ants?

14. Go across the street from the Museum and in the woods you will find at least one rusting automobile skeleton. Examine it carefully. Then define "environmental obscenity."

15. Sit down in a corner of the Museum, by a tree or building, or wherever. Close your eyes and receive the sounds which are available to your ears. What feelings do these sounds evoke? Do you like the feelings which various sounds evoke?

16. List in your mind the many items which you used today which came from nature. Now, list what you returned. What are you good for -- environmentally?

17. Pretend that you are something living which you see out-there, beyond yourself. Can you imitate what it looks like? Sounds like? Feels like?

18. Explore the grounds of the Museum and list things which you have never seen before in your life. Select the five most significant things on your list. Are they "natural" or "person-made"? How did you decide upon "significance"? What does that tell you about yourself?

19. What if? What if you had to live alone out in the woods, such as the wooded areas of the Museum? What would you miss first? What would you miss most? What does this tell you about yourself?

## II JUST FOR TEACHERS AND LEADERS

The activities provided above are rather unique and interesting components of environmental education for persons of all ages. But we should take time to see what makes them interesting and somewhat unique.

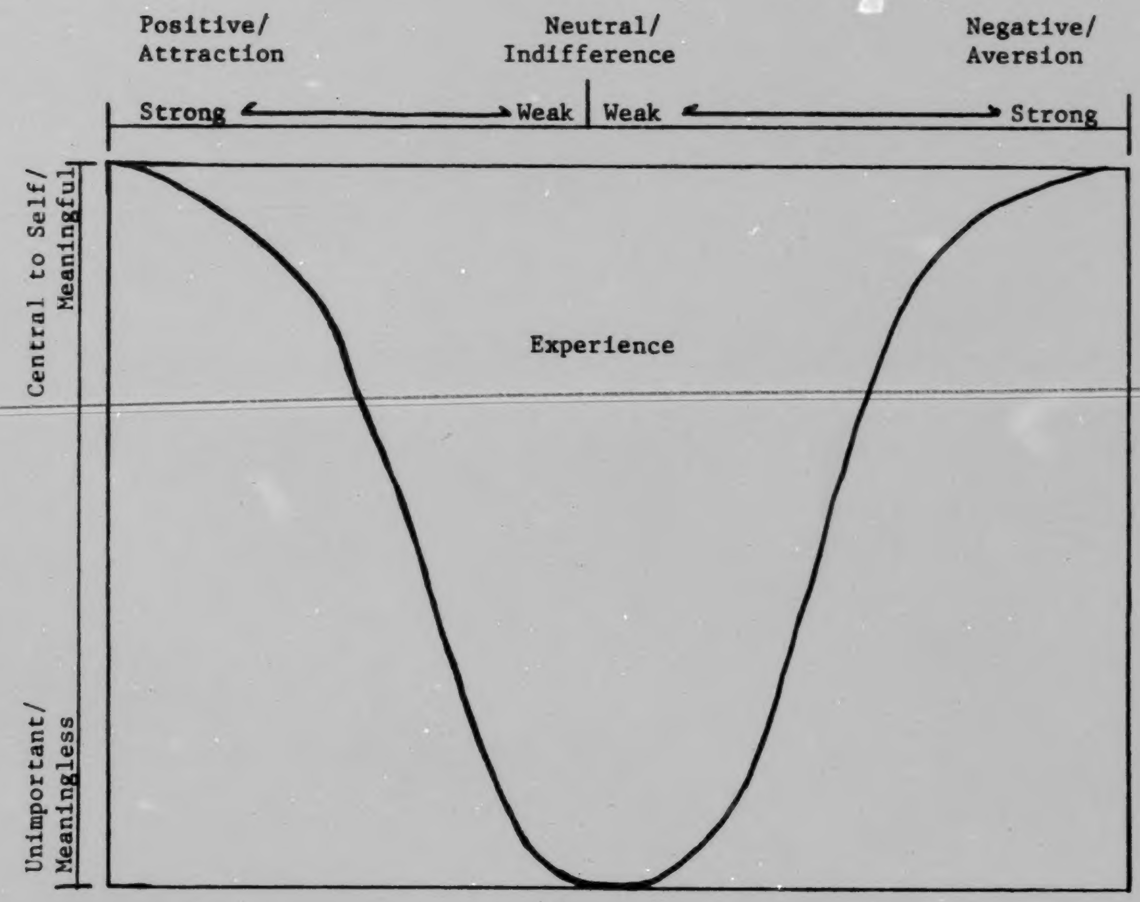
1. Let's assume that there are two dimensions of human experience which are powerful in education: Meaning and Emotion. Immediately we recognize that some experiences are more meaningful (i.e., make more sense to us, or help us to make sense of ourselves and the things about us) than other experiences. We recognize that some experiences have stronger emotional significance than others.

   Question: If you wanted to teach something really important about the environment, into which of the four cells below would you want such an educational experience to fit?

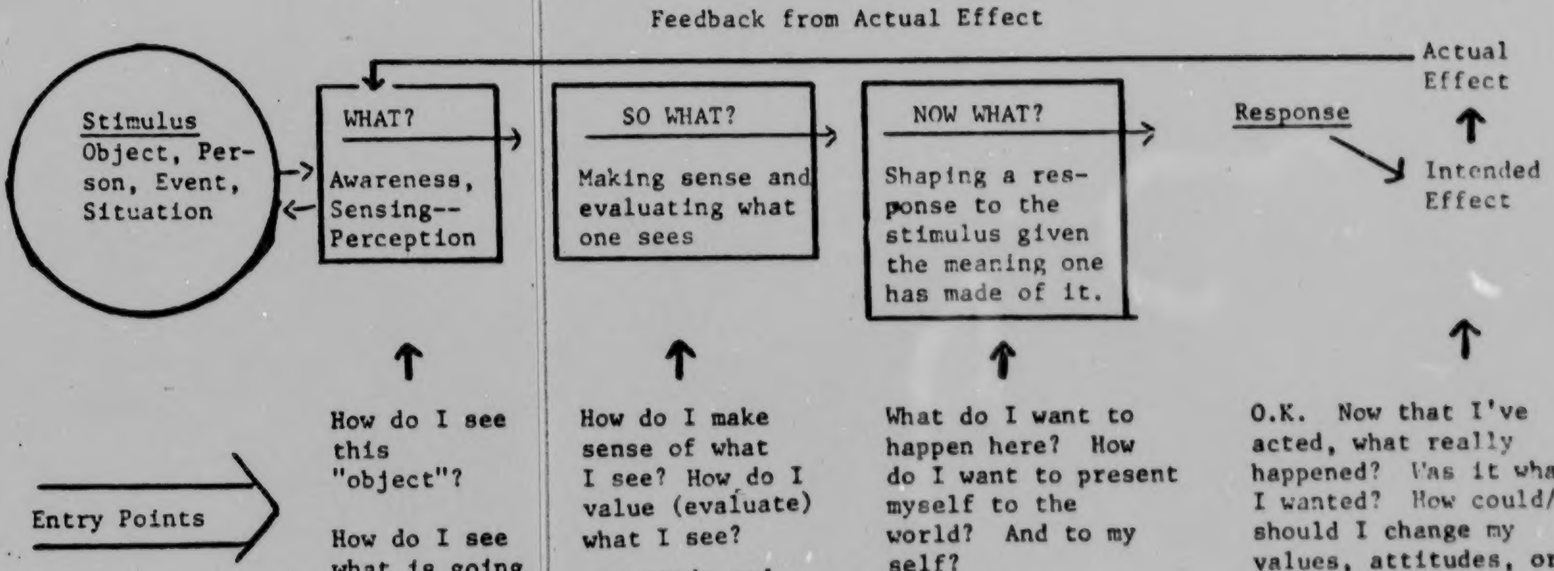
EMOTION

| MEANING |  | Weak(-) | Strong(+) |
| --- | --- | --- | --- |
|  | Weak(-) | 1. | 2. |
|  | Strong(+) | 3. | 4. |

2. Few educators would opt for cells #1 and #2 where meaning was weak. But to permit further reflection let's look at the two dimensions again, in another diagram. Remember that almost all school learning activities fall in the middle of the diagram-- where experience is less meaningful, emotional, and personal. There is an inverse relationship which emerges: The more meaningful an experience could be, the less likely it will occur in a person's school learning. We would argue that this is an enormous error, especially in environmental education, which may be corrected in part by the activities in this booklet and by following the model on the next page.


Positive/ Attraction
Neutral/ Indifference
Negative/ Aversion
Strong
Weak
Weak
Strong
Central to Self/ Meaningful
Experience
Unimportant/ Meaningless

# ENTRY POINTS FOR COPING WITH VALUES, ATTITUDES, AND FEELINGS


Feedback from Actual Effect
Actual Effect
Stimulus
Object, Person, Event, Situation
WHAT?
Awareness, Sensing--Perception
SO WHAT?
Making sense and evaluating what one sees
NOW WHAT?
Shaping a response to the stimulus given the meaning one has made of it.
Response
Intended Effect
Entry Points

How do I see this "object"?

How do I see what is going on in this situation?

How do I make sense of what I see? How do I value (evaluate) what I see?

-my needs and motives?
-my past experiences?
-my culture, parents, peers, etc.?
-my knowledge of self and others in such situations?
-my past pleasures and pains, my life goals and hopes for the future?

What do I want to happen here? How do I want to present myself to the world? And to my self?

Is my intended response fair, reasonable, responsible? Is it appropriate to the situation?

O.K. Now that I've acted, what really happened? Was it what I wanted? How could/should I change my values, attitudes, or feelings?

## III MORE ENVIRONMENTAL EXPERIENCES

1. Ask the students to look at the animals.

   --What would these animals be like in the wild?
   --If you were one of the animals what would you say to the people watching you?
   --Do you believe the cages are necessary?
   --How do these cages compare to a home?
   --Why do we keep wild animals in cages?
   --Why do we keep pets?
   --Does love compensate for freedom?

2. Select on the continuum below (You are encouraged to choose either the 10 or 15 year period) either 1979, 1984, or 1989 and indicate graphically, mentally, or in written form where you expect to be (milestones) educationally, socially, economically - whether you expect to be single, divorced, a Minister, wealthy, retired or simply relaxing in the sun and sand of Florida. (Share your ideas with others.)

   Assume that you will be 10 or 15 years older and that your life and daily activities will be somewhat different from what they are now educationally and socially during that period. Indicate in terms of Erik Erikson's life stages - Adulthood and Maturing Age one of the following words or phrases to show your perception of life you believe that state will be: "most successful," "happiest," "most satisfying." Why? Explore this state in terms of the questions indicated in SO WHAT section of our model. In sharing your feelings with colleagues regarding your perceptions, you are asked to respond to all questions, however, the "Fifth Amendment" may be employed to protect your very personal or private concerns.

Continuum

1974 1979 1984 1989

WHAT (Sensing) What do you envision to be your goals in 1979, 1984 or 1989? What avenues or routes are available and what plans need to be developed to reach these goals?

SO WHAT (Transforming) How do I make sense of what I see in 1979, 1984 or 1989? What will my needs and motives be? How will I relate to my past experiences, peers and pleasures?

NOW WHAT (Acting) What do I really want life to be like at this period in my life? Were my responses fair, and reasonable? Were my responses appropriate to the situation?

EFFECT: Now that I have shared my feelings, what happened? Should I change my feelings and attitudes?

3. We are in the midst of a nostalgia craze which seems to be prompted in part by a desire to return to a simpler time. This interest in the past is especially keen among adolescents searching for alternative life styles. This lesson focuses on life styles, past, present, and future.

Do students note the advantages, disadvantages of a life style associated with Pioneer Farm?
Do students indicate the positive and negative aspects of their present life style?
Do students offer comparisons between their present life style and that of the past?
Do students suggest ways in which they might alter their life style in the future?

Students might test the following assertions:

a) The good ole days are a topic of much discussion today.
b) People are becoming more and more interested in the quality of their lives.
c) There is a tendency to look to the past for life style models, and for criteria to evaluate where we are today.

Before going off to explore on their own the students are instructed to record any evidence they see indicating the quality of life of the people who lived in a farm like the one in the Museum. After an appropriate amount of time students are asked to return to the starting point and share observations. Discussion begins with concrete examples but quickly moves to abstract suppositions.

Discussion Starters:

--What do you think life was like in Pioneer Farm?
--What evidence did you find to support your view?
--What are some of the advantages, disadvantages of this life style?
--Do you think the people who lived in communities like Pioneer Farm were happy with their life style? Explain.

Compare the life style of Pioneer Farm to your life today. List the important ingredients that determine the quality of life depicted in the Farm, then compile another list including the essential elements of your life today.

Discussion Starters:

--What alternatives are possible for you today?
--To what extent should quality enter into the selection of a particular life style?
--What would be your ideal choice of life style?
--What life style are you likely to lead?
--Does a person determine life style or is this decided by the society?
--Can you have more than one life style during a lifetime?
--How do you feel about your present life style?
--Would you like to have lived in the original Pioneer Farm? Explain.

4. After experiencing a nature walk, the students will then participate in group discussion by identifying as many examples of both nature and man as possible as a result of their walk. Each student will then choose to role-play one of the examples of nature (like a tree as one example) and express how it might feel in living in the woods they had just walked through.

5. After experiencing a nature walk, the students will then participate in group discussion related to the following questions put forth by the teacher: What are some of the benefits if any, of nature to man? What are some of the benefits if any, of man to nature? Can one survive without the other? Why or why not? How can man help to preserve this partnership?

6. After experiencing a nature walk, students will discuss the following related questions: As you walked through the woods, what was most apparent to you? Would you say that because man has become so totally involved with materialism in our society, he has lost appreciation for that which is provided free to him, for that which should be most valuable in life? What are some ways in which we can help inform the people of our community to the importance of our environment? What clean-up projects can we undertake?

7. Each student is to observe the farmstead on his own and make a list of all clues which might help one in placing an approximate time and location on the farm with regard to when and where it was probably built and lived in. Students will then share their observations with the rest of the class with the hope of having the entire class reach a final consensus. Students will not be allowed in the General Store till after the activity for fear of having them discover the correct time or location on the post cards or reading material provided for sale.

   This activity would stress thinking, observation, communication, cooperation, and hopefully intellectual development. The purpose would be to help students become more conscientious observers who would then have a better understanding of what farm life was all about in Florida's Panhandle during the late 1800s.

8. Compare man's limitations towards transportation and a specific animal's limitations towards transportation. If you were the animal concerned, how would you feel? What would you like "man" to do about it?

9. Compare the chances of survival between an animal having spent his entire life in a zoo and an animal who has never seen a zoo if they were both placed in a different environment. Which animal would you rather be? Why?

10.. Spend twenty minutes with two other people under a sheet. During the experience, think of the three raccoons in the cage. Discover any problems that you or the raccoon would encounter in the new limited environment.

11. Be a zoo animal. Write a letter to the authorities requesting specific improvements. Be sure to include reasons to substantiate your requests.

12. If man were an endangered species, how would you feel if the authorities decided to put you in a cage?

13. Who does the zoo benefit --people or the animals?

14. Select an animal that you are most like. Act as a spokesman for this animal.

15. Field Trip:

a) On this part of the trip no one is to pass the leader (safety).
Find things that you think are beautiful.
Save them by putting them in your mind.

b) At a selected spot, the teacher and the class discuss what they thought was beautiful.
Why was it beautiful?
Lie on your backs, close your eyes and try to see your beautiful things.

c) On the return trip pupils are to wander individually back to the starting point.
Find something that you would like to give to someone very special.
Bring it back in your minds.

d) Discussion when all have returned.
  i) Who would like to share what they found?
  ii) What trip did you enjoy more --going or returning? Why?
  iii) Why did I want everyone to stay behind me on the first trip?
  iv) Draw your "prize" so that you can actually give it to the person concerned.

16. AWARENESS at the Museum:

a) Imagine that you have something of great value that you want to hide so that no one will find it. Spend the next ten minutes finding a hiding place, hide your object--and return here.

b) As students return they are to draw maps showing where their treasure is hidden. As they are turned in to you, pair people up. (Each person using his partner's map is to search for the treasure while his partner observes; upon completion, reverse roles.) Finally return to home base once each person has found the other's treasure.

c) Evaluating discussion at completion of exercise.
  i) While looking for a hiding place a) who used the roads?
  b) who went into the woods? How do you interpret these actions?
  ii) How did you decide upon your hiding place? Bury it? Camouflage? Under something?
  iii) How did you feel as your partner approached your hiding spot?
  iv) How did you feel as you were approaching his hiding spot?

17. Litter and Morality:

1. Littering is a concept that we all orally detest. According to Kohlberg's model of moral development* there are six different kinds of people that would offer six different opinions about

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*See Lawrence Kohlberg. "The Child as a Moral Philosopher," Psychology Today, August-September, 1968.

littering. Draw a number from the bucket. Assume that this represents your level of moral development. Find a comfortable spot around here and write a few sentences re your "imaginary" level of development (write justifications why people should not litter according to their level of development.)

2. After completing this task, state your true level of development. Give reasons to justify your statement.

3. Apply Rath's model of valuing to this exercise. Go as far as you can.

4. Evaluatory Discussion:

    1) Discussion of Kohlberg's six stages.
    2) Does Kohlberg's model now make more sense since we last discussed it in class? Why? Why not?
    3) What did you do upon completion of the written assignment? Relate this to Rath's seven steps.
    4) How is this lesson different from others that we have participated in as a unit?
    Suggested answers - Value conflict not as great as in other situations? Too cognitive orientated?

18. Given a random collection of maps, each student will be able to read and identify map stating symbols, scales, and grids. Using this information, each student will be able to construct map of a local environment.

Activities:

a) Collect maps of different types and various areas.
b) Read and learn symbols. Teacher will ask students orally.
c) Make map and grid of classroom.
    1) pick center of classroom
    2) discuss and come to agreement of directions in relation to Tallahassee
    3) place student at center of room, call point (0,0)
    4) from point (0,0) locate other things in room using East-West from (0,0), then North-South
    5) locate own desk in relation to (0,0)
    6) locate teacher's desk in relation to (0,0)
    7) on piece of paper 12" x 18" set up N S E W points. (each student).
    8) measure length and width of room and use scale that will
        i) draw grid based on this scale
        ii) use as model of floor space
        iii) find center of grid point (0,0)
        iv) locate student's desk, teacher's desk, tables, sinks, closets, and other furniture in room
        v) show objects on grid so that this becomes map of classroom
        vi) students may color, put pictures of furniture, or whatever they wish to their map.
        vii) students will compare maps and agree on changes to be made

19. Walking through a wooded part of the Museum, be aware of what is taking place about you. When something really interests you, sit down and try to be (or be part of) that which interests you (i.e., a leaf falling, a log rolling, a bird flying). From this perspective, think about how you are treated by others and by "nature," how others treat you, and if and how you can control what happens to you.

20. Sitting in a wooded area of the Museum, identify various interactions taking place around you. How are these activities interdependent and dependent upon one another? How are human interactions like those natural interactions which you see at the Museum? Share your thoughts with others.

21. Meander through the Museum for a while, especially in wooded areas along the lake shore. What does the word "being" mean? What does the word "becoming" mean? Are the things you see "being" or "becoming"? Is anything totally alive or totally dead? Answer (to yourself) these questions: I know that I am alive because ____________________________.
I know that I am "being" or "becoming" because ________________________.

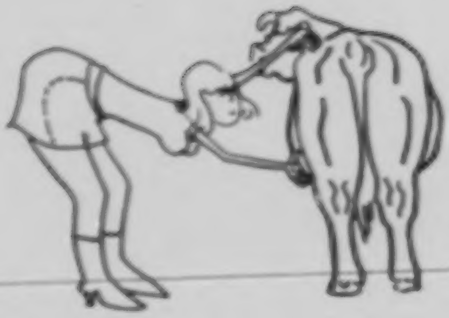
22. Explore the areas where animals may be found at the Museum. Record the differences you notice between restricted and natural habitats (cages and free habitats). Notice the birds in trees and the eagle, the raccoon and the deer. How are these two features -- restricted habitats and natural habitats -- analogous to the human condition? What conflicts result from the restrictions or from the contrasting restrictive and natural habitats of persons?

23. Collect a variety of items from a setting in the Museum --leaves, sticks, nuts, cans, bottles, litter, etc. List all of the items and then categorize them in a variety of ways: color, form, shape, plant/non-plant, person-made/natural, etc. Then, generalize between classifications.

24. List all of the "things" in an area near a small stream of water. Observe changes that occur --and things which do not change (in several visits, or at various times during a visit). Generalize about the relationships among the items observed. Chat with others about your role in environmental change.

# THE ANIMALS AT THE
# JUNIOR MUSEUM

Timothy Aikin
Debbie Haywood
Judi Gunn
Lynn McCorkle
Kenneth Detzner
Betsy Schuetz



and the students of the
Natural Bridge School

Mark Benton
Lynda Benton
Sarah Edgerton
Laurie Barnes
David Moore
Steve Edgerton
Brooks Hall
Marc Berman
John Vinson
DeLane Matthews
Jim Sturges

# Cows

## Introduction

Cattle have been domesticated as a source of food and clothing and for use as draft animals. Cattle are raised in every state of the United States and in every province of Canada.

Cattle are named according to their age and sex. These names are:

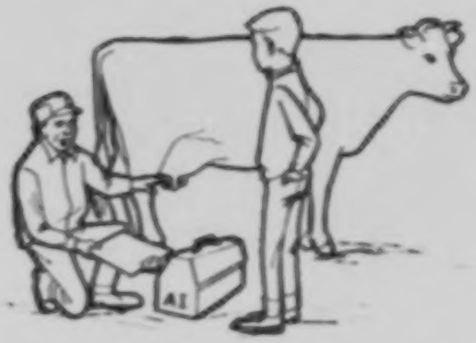
young cattle - calves
between the ages of one and two - yearlings
mature male cattle - bulls
mature castrated male cattle - steers
full-grown steers used for draft purposes - oxen
female cattle that have not given birth - heifers
mature female cattle - cows

Cows are mammals used for two main purposes: for milk and dairy products and beef. Cows are large animals. Beef cattle are wide with fleshy backs; dairy cattle are leaner. The cow at the Junior Museum is a Guernsey. Her name is Sarah; she is a dairy cow. Sarah and all other dairy cows have large baggy organs called udders in front of the back legs. Each udder has a nipple. Udders hold the milk. When a person puts pressure on the nipples or a calf sucks on them the milk squirts out. Beef cows have smaller udders that are used only by the calf.

Cattle have four parts to their stomach. After the cow eats its food, it goes into the first two parts. After a while in there it comes back up as the cud; then the cow rechews it and it goes back through all four parts into the intestine.

## Care and Maintenance

Cattle like most big animals need a lot of care. Starting with food, cows need to be fed grain and hay twice a day, if in a stall. If they are in a grazing pasture, naturally not as much food is needed. Next, their stall should be kept clean and dry. Some hoof diseases are caused by wet, mushy ground. In the summer it is nice to have fly spray to keep flies off the cattle.



Before you milk a cow it is important to wash the cow's udder so dust, dirt, or hair doesn't fall into the milk. The cow's head should always be put in bars called stantians to keep the cow from moving around while milking is being done.

A veterinarian should be consulted about any sickness of the cattle or about necessary shots.

## Activities

1. What is Sarah doing?
2. Call her name. How does she respond to you?
3. If she comes to the fence don't be afraid to pat her gently. Does she seem to like it?
4. Does the calf (Earle) seem shy or forward?
5. Look closely at Sarah's mouth. Is her top and bottom lip the same length?
6. What do you like about Sarah?

## Personal Experiences

### Sarah the Cow

When I went to the Junior Museum I learned a lot about farm animals. I enjoyed them, but I like the cow, Sarah, the most. Sarah is gentle and is very nice except when she's eating. She is not mean, but does not pay attention to what is going on around her. For instance, she stepped on my foot and it did hurt. Of course I was loving her and she wasn't watching, so just don't get really close to her when she's eating. She doesn't get nervous about your messing with her child, Earle Butz, her baby bull. But she does love her baby, and I'm sure that Earles loves her too.

### Milking Sarah

It was fun when we were milking Sarah for the first time. The next time we milked her we got at the most 2 cups. Then the next time we got at the most 2&1/2 cups, but Sarah was acting strange that day and she picked her foot up and stubbornly put it down in the milk. After that day we didn't have any more trouble.

When I milked the cow it was hard at first but I got used to it. It was fun. Sarah got mad and stepped in her/wow! I am glad you don't have to clean cow's hooves. You should be ready for her when she steps on your feet. She might break a toe or maybe even your foot. It happened to me.

Lynda Benton

I worked with Sarah and Lynda on the cow and her calf. It was a good experience because I had always been a little afraid of cows, and working so close to one really helped me. I learned about the different types of food a domestic cow needs, how to milk a cow, about when a calf begins to eat solid foods, and how to shovel manure.

Laurie Barnes

## Cows

One of my very happy experiences at the Junior Museum was with a little six-weeks-old calf named Earl Butz. I went to his pen often to groom him and his mother Sarah. I fed them and cleaned their pen, too. On one occasion when I was taking the leaves out of the water trough Earl walked up and put his nose in the water and snorted. I thought he might want to drink so I got some water in my hand. He looked at it for a while and then started to suck on my fingers. He would wrap his tongue around my fingers and pull them into his mouth just like he did to his mother. He did this for a long time. He would push my fingers with his tongue up against the roof of his mouth. At that time he had only front bottom teeth and a few in the back. Soon he will be able to eat and drink by himself.

Sarah Edgerton

## Tommy the Donkey

### Introduction

The donkey was first known to the ancient Egyptians before the horse and probably was caught and tamed in the Nile valley. It is known for its sure-footedness and agility in mountainous and rocky terrains. The donkey feeds on dry coarse scrub instead of grass and grain, making it less expensive to raise than a horse. For these reasons and others the donkey is the principle beast of burden in many countries.

### Activities

1. Tommy does bite. Why do you think he does that?

2. What parts of Tommy's body look especially suited to mountain climbing?

3. Call Tommy's name and watch his ears. Does he respond?

4. How old do you think Tommy is?

5. Would you like to have a donkey?

## Harmen the Mule

### Introduction

The parents of mules are always a male donkey and a female horse. The offspring of a male horse and a female donkey is a hinny. A male and female mule cannot breed because they are both sterile. Only in the most rare circumstances has a female mule been bred to a stallion. This offspring would be two-thirds horse and one part donkey.

A mule is a very sure-footed and useful animal in mountainous countries. It can endure more than a horse and will eat food a horse will not. Mules should not be put to work before they are four years old, but they will be useful for twenty to thirty years.

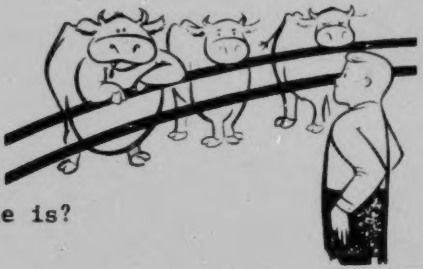
### Care and Maintenance

1. A mule eats three or four times a day due to his small digestive track.

Harmen eats sweet feed which is a mixture of corn and molasses. He also gets alfalfa cubes and hay.

2. His coat needs to be brushed regularly to keep it shiny and to keep the loose hair from matting. Mules change coats like most animals when the seasons change.

3. If a mule is kept in a pen, the pen needs to be cleaned frequently. Parasites breed and grow in manure which can be transmitted to the animal.



## Activities

1. Where is Harmen?
2. Is the temperature hot or cold?
3. Do you think this makes any difference about where he is?
4. Does he seem to notice you?
5. Mules are said to be stubborn at times. Does Harmen look stubborn?
6. If you were a mule how would you feel if someone were looking at you?

## Activity for Sarah the cow, Harmen the mule, and Tommy the donkey:

1. Look at the backs of the three animals. Which is smooth?
2. Which has a heavy back?
3. Which animal would you rather ride?
4. One animal has shorter hair than the other two. Which one?
5. Does the mule or donkey chew its cud?
6. Who looks heavier--Sarah the cow, or Harmen the mule?
7. Who has a mane?
8. Which animal looks the strongest?
9. Which animal looks the most agile?
10. Which one is your favorite?
11. All three like their food, but which seems to like food the best?

| | Harmen Mule | Sarah Cow | Tommy Donkey |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

# Pigs

## Introduction

Many people think that pigs are dirty animals, but this is not true. Pigs, if cared for properly, are no more dirty than other animals.

The European and American domestic pig (like the one at the Junior Museum) are directly related to the wild boar, and the Chinese domestic pig. The European and American domestic pig has a fairly short head, erect or "floppy" ears, a slender body, and thin legs. The Chinese pig has a short muzzle, a rounded body, and short legs. About two centuries ago (200 years) some pigs of this race were brought to Europe and crossed with the European pig. The result was short-muzzled, fat animals with erect and triangular ears, a long body, and short legs. These pigs were the ancestors of all domestic pigs today. The United States produces about one-eighth of the world's pigs and another important pig producing country is China.

Pigs today are a special breed of animal. They are cared for with the utmost concern and fed high qualities of grain. The most common function the pigs serve is that of food. Ham, bacon, and lard are just a few of the items provided for us to eat by the pig.

If you were wondering if pigs make good pets, yes. They rank ninth in intelligence in the animal kingdom, ahead of cattle and horses.

## Activities and Things to Think About

1. Can you ride a pig? If so, what do you think would happen?
2. Do pigs like the sun?
3. Do you think pigs get lonely?
4. Pigs are so big, do you think they can run fast?
5. Do you think pigs are attractive?
6. What do pigs eat?
7. What kind of sound do pigs make?
8. If you were a pig, would you go on a diet?
9. What do the pig's toes look like?
10. We all know the story of the three little pigs. Can you make up a story about the two big pigs? The one baby pig?
11. Look at the ground where the pig has just walked? Now on a separate sheet of paper draw the imprint the pig makes into the soil and tell as many things about the footprint that you can think of. (For example, how deep is the footprint?) Next, slip off your shoe and press your foot to the ground, (no, not in the pen) draw what you see on another sheet of paper, and write a brief description below it. Do you see any similarities between the two, any differences? What are they?

## Personal Experience

### Rosemary the Pig

Rosemary is a pig and a good friend of mine. She is the biggest, fattest pig I have ever seen. But I haven't seen too many.

I trained Rosemary to come to the sound of a bell. When she came, I would scratch her back so much that she would lie down at my feet so I would scratch her longer. She got used to me and finally came even if I didn't ring the bell. Even later she came to anyone just so she could be scratched.

She would brush against me with her side. It didn't feel gentle but that's what it was meant to be. She is very friendly and I like her a lot.

Before I feel her she grunts loudly, but as she eats her food she grunts softly. She steps in her food with her two front feet and crushes it up. She doesn't eat it when its crushed though. She eats animal pellets and sometimes Bruce mixes Sarah's (the cow) milk up with some corn and Rosemary loves that.

Rosemary isn't here now though. She was uprooting a big tree that was in her pen. She was so big that she ate a lot of food and the Junior Museum couldn't afford that much for one pig. So they sold her to a breeding farm. I'm sure she will like it there a lot. Now they have two new pigs at the Junior Museum. One girl and one boy. Their names are Bonnie and Clyde.

DeLane Matthews

### Chickens

## Introduction

The chicken is one of the most important of all domestic birds. It has a compact body, light skeleton, a strong, usually scaly pair of legs. Like most other birds it is covered with feathers that are usually molted, or shed, once a year. Because its wings are short and weak, the chicken is a poor flier and spends most of its time on the ground. The chicken usually has four toes on each foot, which it can use to scratch the ground for food, and a strong bill, which can be used to crack hard shells and seeds. The chickens diet consists mainly of sweet corn. Here at the Junior Museum the chickens are fed this diet twice during the day.

Like the turkey, the adult chicken has a fleshy, usually wrinkled growth, called a wattle, that you may see hanging down from the chin. It also has a comb, or fleshy crest, on top of the head. Although the wattles and comb are present in both sexes, they are more highly developed in the male. The reason for this difference is that the male uses these features to attract the female with whom he wishes to mate. Only the male has true spurs, which are sharp outgrowths extending from the back of the leg and are used mainly for defense.

The hen house is where many of the birds find shelter during foul weather, but also it is where the female chickens will lay their eggs. Frequently while cleaning out the hen house one may find as many as six freshly laid eggs just like the ones a person may buy at any store.

## Activities and Questions to Think About

1. How many chickens do you see in the coop?
2. Do chickens sleep laying down?
3. Do hens or roosters lay eggs?
4. How many different types of chickens are in the coop?
5. Are certain chickens more dominant than others?
6. Can one chicken talk to another chicken?
7. What is the difference between a chicken and a duck?
8. How many eggs can one chicken lay in one day?
9. What part of a chicken is light meat and what part is dark meat?
10. Why are male chickens (roosters) more colorful than female chickens?
11. On a plain sheet of paper map the movement of a chicken as it moves around the coop. Do this for three minutes. On the same sheet of paper map a different chicken's movements for another three minutes.

    Do you see any similarities in the two chickens' movements? If so, what are they; if not, why not? Now that you are finished you might want to take this map home, it will make a nice picture on your wall.

12. With a group of friends write down on a small sheet of paper the names of the various birds that can be seen in the chicken coop. Next put the names in a box or hat and have each individual select a name. Without telling anyone the bird's name you have chosen, try to imitate the actions of the bird and have your friends try to guess what you are. After you have been guessed it's someone else's turn. When everyone has taken a turn, repeat the game once again.

## Ducks

### Introduction

Ducks are an ancient group of birds and have long been useful to men. Wild ducks were probably hunted more than 6,000 years ago, and they are still valuable as a source of food today.

Ducks have been raised for many centuries for both their meat and eggs. In fact the total number of ducks raised annually in the United States for consumption is about 11 million.

Ducks display a wide variety of colors, including dull brown, red, and shades of green and blue. Male ducks, which are known as drakes, are commonly more brightly colored and more boldly marked than the females which are known simply as ducks.

A typical duck's body is covered by very dense plumage (feathers) overlying a warm layer of downy feathers. By spreading an oily secretion from a special gland at the base of the tail over the feathers, the duck can be protected from water.

Most wild ducks feed by straining particles from the bottom of ponds or lakes through their fringed-edged (strainer like) bill. In this manner they obtain the seeds, vegetation, insects, or small fish that make up their diet. You may find that the ducks here at the Junior Museum will during the proper feeding periods eat some of the grain that is given to the chickens. This is not unusual since these ducks have been in captivity for most of their lives and have become accustomed to sharing food with the other birds.

## Activities and Questions to Think About

1. Can you imitate the sound of a duck?

2. Do ducks have teeth?

3. Why do ducks have a flat bill?

4. Do the ducks in the coop usually stay together?

5. Why do ducks go south for the winter?

6. Does a duck make a good house pet?

7. Why don't the ducks fly away?

8. What is the difference between a duck and a goose?

9. Why do ducks have webbed feet?

10. What do you think it is like to be a duck?

11. On a separate sheet of paper draw an outline of two ducks. With a crayon or colored pencils color in one duck as a female and one as a male.

    Why do you think there is a difference between the color of a male and female duck? Are there any other birds that we may find a difference in the sexes?

12. Using the letters in the word DUCK how many different animals can you make so that the first letter of the word begins with one letter in the word DUCK? For example, C-Chicken, D-Donkey, etc.

## Goats

### Introduction

Wild goats inhabit many parts of Europe, Asia, and North Africa, and domestic goats are among the most widely raised of all farm animals. Domestic goats are valued for their milk, hair, meat, and skin. Sometimes they are used as beasts of burden (used to pull carts of clear land), and occasionally they are kept as pets.

Goats are among the toughest of all domestic animals. They are less subject to disease than sheep and many other domestic animals, and they can withstand extremes of heat and cold. The average life-span of a goat is 14 or 15 years.

Most wild goats have horns, but domestic goats are often naturally hornless. When present, the pair of hollow horns spread up and back from the head. In different breeds the horns vary greatly in size and shape. They may be twisted, thickly ridged, or bumpy. Usually the horns of a female are smaller than those of the male. The reason for this is that the male uses his horns for defense of his female and to prove his dominance over other males.

### Activities and Questions to Think About

1. Will a goat eat anything if he is hungry?
2. If a goat is a different color does that mean the goat is a different kind of goat?
3. How many goats are in the pen?
4. Are some goats more dominant than others? If so, which ones are they?
5. Is there a difference between the behavior of a male and female goat?
6. Can a goat hurt people?
7. What would happen if you tried to ride a goat?
8. Is there a difference between the sound a goat makes and the sound a sheep makes?
9. Are goats really sheep without horns?
10. Why can't the goat and the sheep be in the same pen?
11. Watch very closely the behavior of the goats. Look for the way it walks, speaks, eats. What kind of personality does the goat have? Can you think of any person you have met that may act like a goat? What do you think it would be like to be one of the goats, funny, sad, uninteresting, educational, or. . . .?
12. With a friend who has never been at the Junior Museum ask him some of the above questions and see how many they can answer? If they have some problems help them by telling them all you have learned about the goat.

## Geese

### Introduction

Both wild and domestic geese are larger than ducks and smaller than swans. They have a long neck, a blunt-tipped bill, and relatively short legs. The gander, or male goose, and the female goose are the same size and have identical plumage (feathers). Wild geese are usually a combination of gray, brown, black and white. Domestic geese such as the ones here at the Junior Museum are most often white.

Some geese are raised for food. Their flesh consists chiefly of dark meat which is rich in protein.

Geese are usually raised in small flocks on general farms. Unlike some poultry, geese require very little care. They are hardy birds and can live outdoors without shelter during most of the year.

The female goose usually lays a clutch of 9 to 15 eggs and may produce 12 to 60 eggs during a single laying season in the spring.

### Activities and Questions to Think About

1. Can you pick out which birds in the coop are geese?
2. Are geese feathers used for anything besides keeping the geese warm?
3. Is there a difference between the male and female goose?
4. Why do you think the male goose is the same color as the female?
5. Is a goose just a duck with a long neck?
6. Geese are so big, do you think they can fly?
7. Why do geese like the water?
8. Do geese lay eggs as often as chickens?
9. Why do different birds make different sounds?
10. Do the geese and the duck eat the same things?
11. Write a story of the life of the geese that live in the pen. What do you think it was like for them before they came to the Junior Museum. Are they happy, what do they talk about to each other? If you would like perhaps you could perform before the class or your mother and father the story of the geese at the Junior Museum.
12. Without touching the geese try to talk to them. Do they understand what you are saying? Are they trying to talk back to you? After you try talking to them, make the same sounds they make and see if they understand what you are saying. If you are making the same sound as they do why don't you think they will understand what you are saying? If they do maybe you have made a new friend.

## Snakes

### Activities

1. The snake's skin feels slick and cold to the touch. Look at the design and pattern of the snake's skin and see if you can draw it. Watch the skin as it contracts and expands as the snake breathes.

2. Squeeze a pencil or small stick with you hand, as hard as you can. Imagine you are the indigo snake or one of the rat snakes and the object you are squeezing is a mouse you want for dinner. The indigo and rat snakes among others are constrictors, that is, they kill their prey by squeezing it to death.

3. How does the temperature affect snakes and why are the big lights overhead kept on? Why is this room kept so warm?

4. Can you guess how often these snakes are fed? Find out. Do you think it's the same for drinking?

5. Look at the snake's eyes. Does he seem to be staring at you? Move a little to the side. Is he still staring at you? Do you see any eyelids?

6. Watch the way a snake moves. Is it like you move, with legs? Can you think of a way to move like the snakes? Next time you're in the water, try moving like a snake. Put your arms by your sides, keep your feet together, and legs straight. What kind of bone and muscle structure do you think a snake has?

7. The snake stays coiled up most of the time when he's in a cage. Guess how long these snakes are. The answers are at the end of the personal experience section.

| Name | Length |
|---|---|
| Indigo | |
| Eastern King Snake | |
| Grey Rat Snake | |
| Yellow Rat Snake | |
| Red Rat Snake | |

8. Watch a snake. You'll know he sees you when he sticks out his tongue. What color is it? Does it match his skin?

### Personal Experience

Sometimes it hurts to have a snake around your neck. Sometimes it feels like a massage. When it starts tickling me with it's tongue, I can't stand it. After you have a snake around you for a while though it doesn't tickle as much. When you first get them around you, they try to investigate; they move around a lot. After I get settled they just sit and stare.

---

Tres and I were cleaning out the Junior Museum's snake cages one day and we decided it would be a lot easier to put out all of the snakes at once instead of one-by-one.

So we let out all of the snakes and they were crawling all over the table we set up while we cleaned the cages. I turned around, and suddenly, I saw

Checkers, the red rat snake, crawling under the bleachers. My first thought was that I was really going to get in trouble.

I told Tres to help me lift the bleachers, but we couldn't do it. I grabbed the part of Checkers that wasn't already under the bleachers. Judi, my teacher, walked in and I felt glad that some help was coming. She went and got Bruce, the animal man, and by the time they got back Checkers was slipping out of my hands and was almost underneath the bleachers. Bruce helped us move the bleachers and finally we got Checkers out. We decided that it was better to only have a few snakes out at once. The moral of this story is -- Don't try to do everything at once.

John Vinson

### Answers to Exercise on p. 12 - Length of Snakes

| | |
|---|---|
| Indigo Snake. . . . . . | 7 feet |
| Eastern King Snake. . . | 4 feet |
| Grey Rat Snake. . . . . | 4 and 1/2 feet |
| Yellow Rat Snake. . . . | 4 feet and 10 inches |
| Red Rat Snake. . . . . . | 4 feet and 3 inches |

## Domestic Rabbit

### Introduction

Richard the Rabbit spends much time looking for food. Like most wild rabbits, he has big dark eyes that give him an air of intelligence. It seems like Richard would like to have a wife and family. He is large, twittles his nose and can't stand still for very long. He loves to hop but seldom hops to the sound of his name.

### Care of Richard the Rabbit

Parasites can be very dangerous to Richard. Contamination of foodstuffs by airborne and waterborne parasites make it important to clean his cage thoroughly.* Ringworm, fungus, or worm eggs can be carried by humans entering the cage on their feet. If Richard contracts fungus on his feet, Richard would need a wheelchair.

*The cage is cleaned with Clorox Bleach which forms a very potent acid not recommended for regular home use and dish detergent to kill parasitic germs, worms and cleans dirt away.

## Bobcat

### General Information

The bobcat is closely related to the Canadian Lynx--except the Bobcat has a longer tail, shorter ears and smaller feet. The Bobcat has long legs; it stands about 15 inches at the shoulders. It's tail is 5 to 8 inches long, twice as long as a Lynx's. Bobcats weigh from 15 to 25 pounds. Their coats are pale tan to reddish-brown depending on where they live. Those in dry areas are tan and those in damp areas are darker. Bobcats usually hunt at night. They eat rabbits, ground squirrels, rats, mice and occasionally birds.

## Raccoons

### General Information

All the different kinds of raccoons live in North and South America. Raccoons have long legs and strong claws. They are famous for climbing trees, and live in hollow trees. In cold climates, they sleep for long periods during the winter, but do not hibernate. Raccoons also make dens in rocky ground or on ledges. Like bears, raccoons eat almost anything that they can find. Their favorite foods are frogs, crayfish, turtles, and other fresh-water animals. Berries and other fruits are also liked very much by raccoons. They very often ruin corn crops. If water is near, they wash their food in it before eating. Raccoons usually live 10 to 12 years.

## Bears

There are two bears at the Junior Museum. One weighs about 250 pounds and the other is 190 pounds. You can often see the bears scratching on trees and stumps. Apparently they do not like the water because when the food is in the water they do not go in to get it. They generally eat fruit and dog biscuits. They sleep in the trees and play in the trees. They sleep a lot of the day, or they stay in the shade. The bears like to climb in the trees so they had to cut the limbs to keep the bears from getting out.

### Activities

1. Do the bears have claws or toenails?

2. Do all the bears at the Junior Museum have the same color eyes?

3. How are the male and female bears different?

4. The Grizzly bear and the Alaskan Brown bear have humps. Do these bears have humps?

5. What do the bears' hind feet look like?

6. How do the bears scratch their backs?

7. Are the bears right-pawed or left-pawed?

8. Do the bears walk on four legs or two?

## Personal Experience

### The Florida Black Bear

These two Florida Black Bears, which belong to the Junior Museum, are very interesting to watch. To learn about them one should only observe. The reason for their living in a habitat is so that people can observe them in the wild. These bears may look cuddly, but they are dangerous and should not be teased or provoked.

The two bears are unnamed. They are both two and a half years old. They are omnivorous, meaning they eat both animal and vegetable food. Bears like fruit, grubs, some meat, insects, and grapes. They do not usually attack for meat, and yes the myth is true bears do like honey. The bears here at the Junior Museum eat apples, dry dog food, bear biscuits, pears and sometimes hard-boiled eggs.

The bears are really fun to watch. They climb trees with the greatest of ease. Once at the top they sit on the flimsiest of branches and sway back and forth. They use trees a lot. They claw them and use them as territory markers; they eat young shoots on trees and they even stand on their hind legs.

If one looks around the habitat one notices signs of digging. Usually bears live in a cave,but the habitat does not have one, so the bears are trying to make a den. The habitat allows us to learn many things about the bears, and also allows them more freedom than a cage.

There are approximately 1,000 black bears in Florida. Black bears have an estimated value of $1,000. Unless they become a menace to human life and livestock, one of Florida's most impressive wild animals deserves the fullest protection it can possibly get.

APALACHEE AUDUBON CHAPTER
Tallahassee Florida 32302
P.O. Box 1237

April 1, 1975

Dear Audubon Member:

This booklet is for you! Look it over and think about the questions. Ask your friends to help you find the answers, then share the booklet, questions and the products of your research with teachers of all kinds. Get involved with the wonderful world of wildlife around you!

Thank you, Wallace Hughes. Wally's art work has graced the covers of Florida Wildlife for many years. The inside pages of this fine magazine have contained a great deal of valuable information in Wally's "Florida Wildlife Scrapbook." Some of these illustrations are reproduced in this booklet to increase their distribution to persons who are interested in the preservation of wildlife resources through education. And so Wally, thanks for the thought, effort and talent that have gone into the "Scrapbook" and for giving us the opportunity to extend your contribution to other educators.

The questions in this booklet were generated by members of the education committee of the Apalachee Audubon Chapter with "a little help" from the Environmental Education Project Staff.

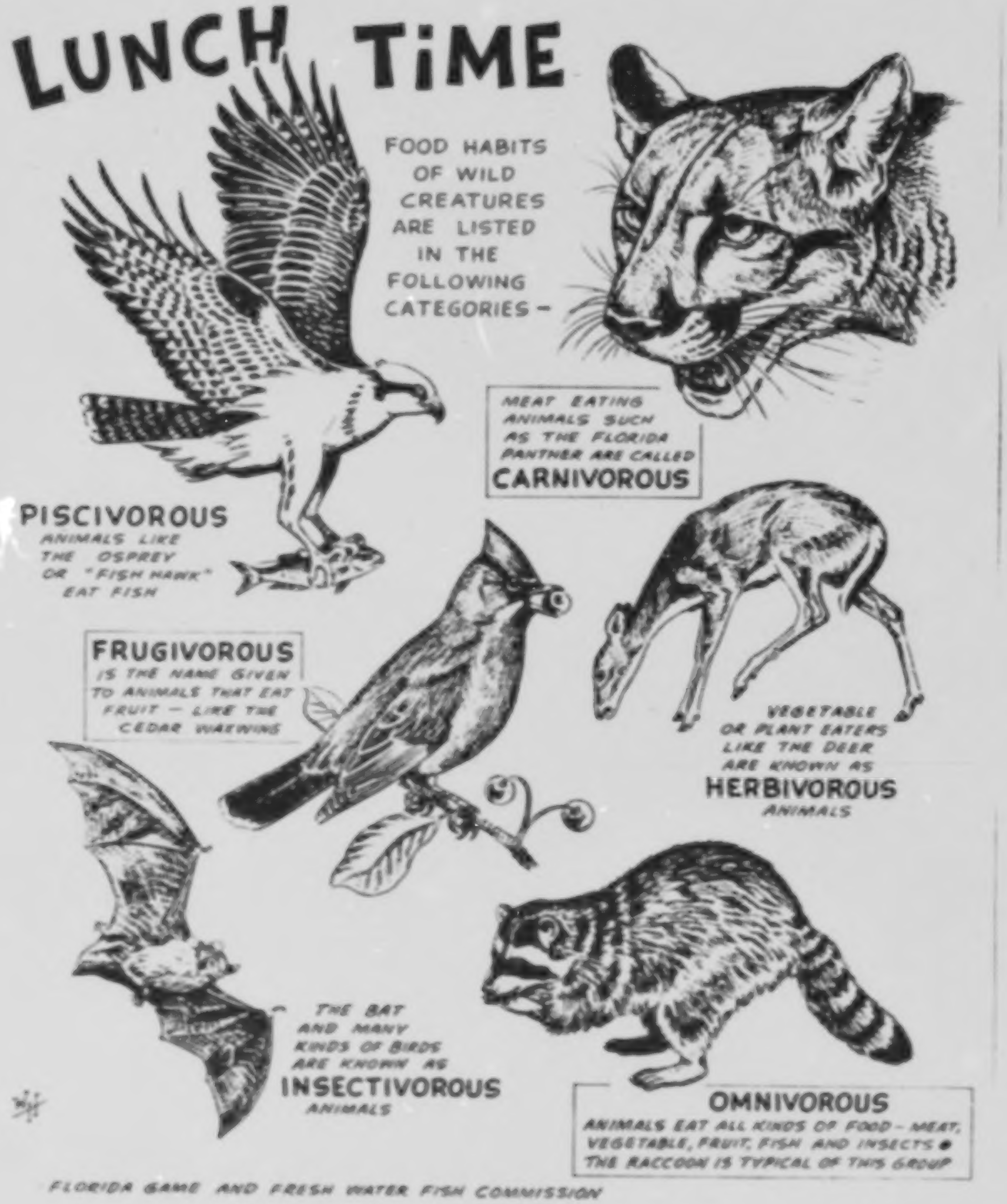
Sincerely,

Helen T Grissett

Helen T. Grissett
President, Apalachee Chapter

Education Committee:

David LaHart, Chairman
Glenda Sears
Helen Grissett
Al Simmons
Betsy Thomas



# LUNCH TIME

FOOD HABITS OF WILD CREATURES ARE LISTED IN THE FOLLOWING CATEGORIES –

MEAT EATING ANIMALS SUCH AS THE FLORIDA PANTHER ARE CALLED **CARNIVOROUS**

**PISCIVOROUS** ANIMALS LIKE THE OSPREY OR "FISH HAWK" EAT FISH

**FRUGIVOROUS** IS THE NAME GIVEN TO ANIMALS THAT EAT FRUIT — LIKE THE CEDAR WAXWING

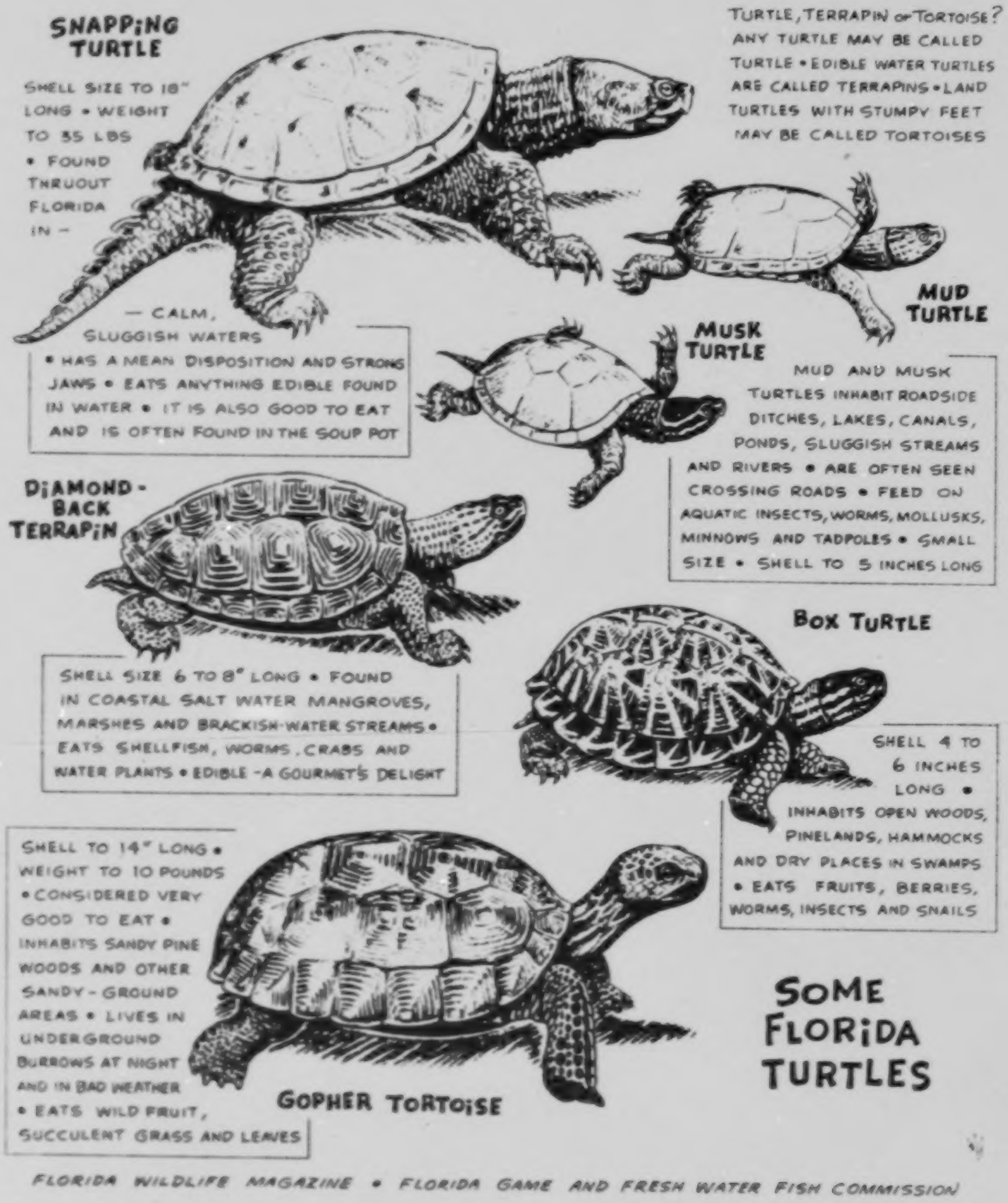
VEGETABLE OR PLANT EATERS LIKE THE DEER ARE KNOWN AS **HERBIVOROUS** ANIMALS

THE BAT AND MANY KINDS OF BIRDS ARE KNOWN AS **INSECTIVOROUS** ANIMALS

**OMNIVOROUS** ANIMALS EAT ALL KINDS OF FOOD – MEAT, VEGETABLE, FRUIT, FISH AND INSECTS • THE RACCOON IS TYPICAL OF THIS GROUP

FLORIDA GAME AND FRESH WATER FISH COMMISSION

Explain how all these animals depend on green plants.
Which category does man fit in? If you had your choice, which would you prefer?
If one of these categories of animals was eliminated, what would happen? What would happen if there weren't any predators?
Name some other animals that would fit in each of these categories.
Can animals change from one category to another? Which animal would be most likely to change?



**SNAPPING TURTLE**

SHELL SIZE TO 18" LONG • WEIGHT TO 35 LBS • FOUND THRUOUT FLORIDA IN — CALM, SLUGGISH WATERS • HAS A MEAN DISPOSITION AND STRONG JAWS • EATS ANYTHING EDIBLE FOUND IN WATER • IT IS ALSO GOOD TO EAT AND IS OFTEN FOUND IN THE SOUP POT

TURTLE, TERRAPIN or TORTOISE? ANY TURTLE MAY BE CALLED TURTLE • EDIBLE WATER TURTLES ARE CALLED TERRAPINS • LAND TURTLES WITH STUMPY FEET MAY BE CALLED TORTOISES

**MUD TURTLE**

**MUSK TURTLE**

MUD AND MUSK TURTLES INHABIT ROADSIDE DITCHES, LAKES, CANALS, PONDS, SLUGGISH STREAMS AND RIVERS • ARE OFTEN SEEN CROSSING ROADS • FEED ON AQUATIC INSECTS, WORMS, MOLLUSKS, MINNOWS AND TADPOLES • SMALL SIZE • SHELL TO 5 INCHES LONG

**DIAMOND-BACK TERRAPIN**

SHELL SIZE 6 TO 8" LONG • FOUND IN COASTAL SALT WATER MANGROVES, MARSHES AND BRACKISH-WATER STREAMS • EATS SHELLFISH, WORMS, CRABS AND WATER PLANTS • EDIBLE – A GOURMET'S DELIGHT

**BOX TURTLE**

SHELL 4 TO 6 INCHES LONG • INHABITS OPEN WOODS, PINELANDS, HAMMOCKS AND DRY PLACES IN SWAMPS • EATS FRUITS, BERRIES, WORMS, INSECTS AND SNAILS

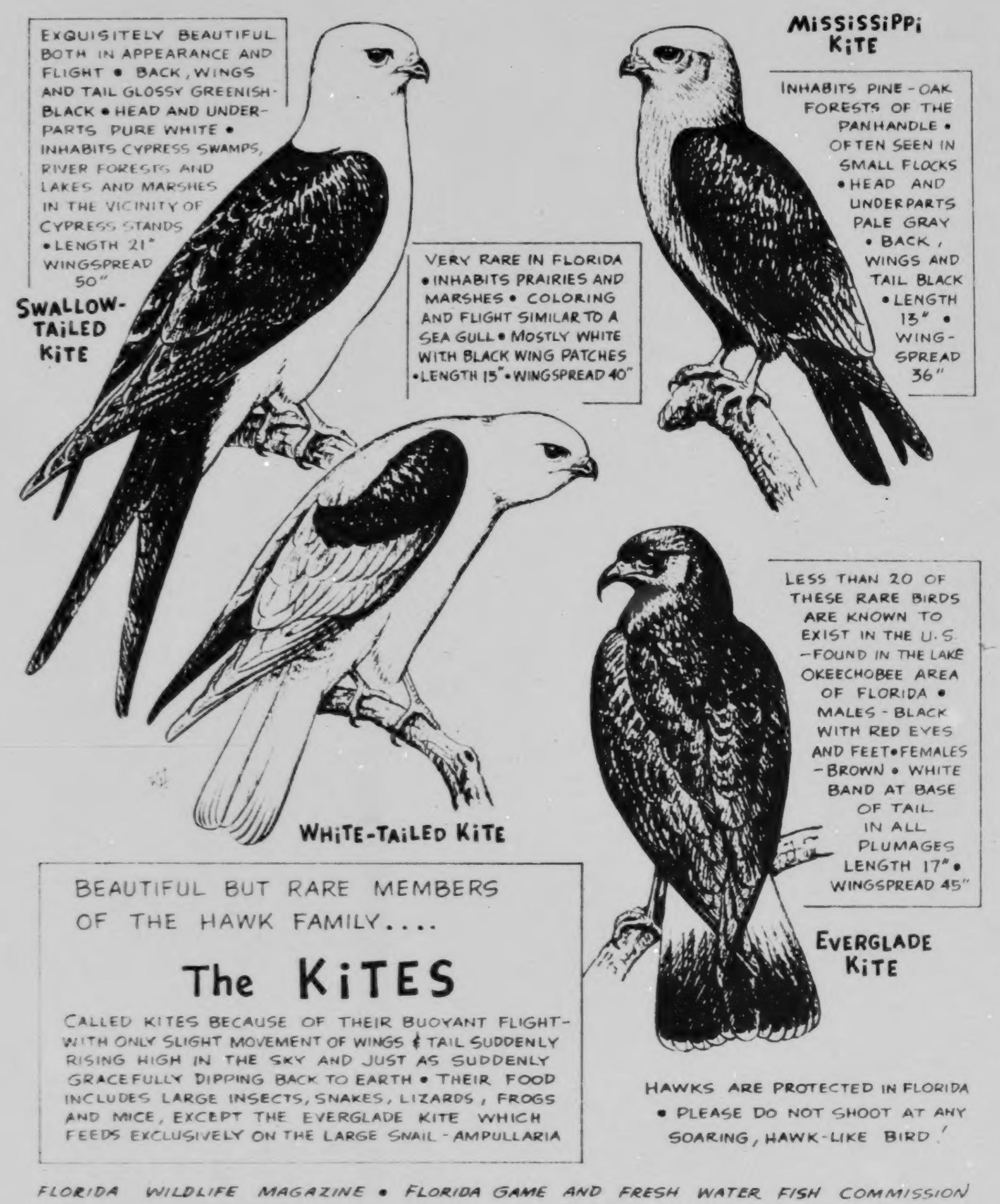
SHELL TO 14" LONG • WEIGHT TO 10 POUNDS • CONSIDERED VERY GOOD TO EAT • INHABITS SANDY PINE WOODS AND OTHER SANDY-GROUND AREAS • LIVES IN UNDERGROUND BURROWS AT NIGHT AND IN BAD WEATHER • EATS WILD FRUIT, SUCCULENT GRASS AND LEAVES

**GOPHER TORTOISE**

## SOME FLORIDA TURTLES

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

Why are there so many kinds of turtles?
What would people look like if they wore their skeleton on the outside?
What prehistoric animals are related to turtles?
Explain the function of the Gopher tortoise in the biotic community.



EXQUISITELY BEAUTIFUL BOTH IN APPEARANCE AND FLIGHT • BACK, WINGS AND TAIL GLOSSY GREENISH-BLACK • HEAD AND UNDERPARTS PURE WHITE • INHABITS CYPRESS SWAMPS, RIVER FORESTS AND LAKES AND MARSHES IN THE VICINITY OF CYPRESS STANDS • LENGTH 21" WINGSPREAD 50"

**SWALLOW-TAILED KITE**

**MISSISSIPPI KITE**

INHABITS PINE-OAK FORESTS OF THE PANHANDLE • OFTEN SEEN IN SMALL FLOCKS • HEAD AND UNDERPARTS PALE GRAY • BACK, WINGS AND TAIL BLACK • LENGTH 13" • WINGSPREAD 36"

VERY RARE IN FLORIDA • INHABITS PRAIRIES AND MARSHES • COLORING AND FLIGHT SIMILAR TO A SEA GULL • MOSTLY WHITE WITH BLACK WING PATCHES • LENGTH 15" • WINGSPREAD 40"

**WHITE-TAILED KITE**

LESS THAN 20 OF THESE RARE BIRDS ARE KNOWN TO EXIST IN THE U.S. — FOUND IN THE LAKE OKEECHOBEE AREA OF FLORIDA • MALES - BLACK WITH RED EYES AND FEET • FEMALES - BROWN • WHITE BAND AT BASE OF TAIL IN ALL PLUMAGES LENGTH 17" • WINGSPREAD 45"

**EVERGLADE KITE**

BEAUTIFUL BUT RARE MEMBERS OF THE HAWK FAMILY....

# The KITES

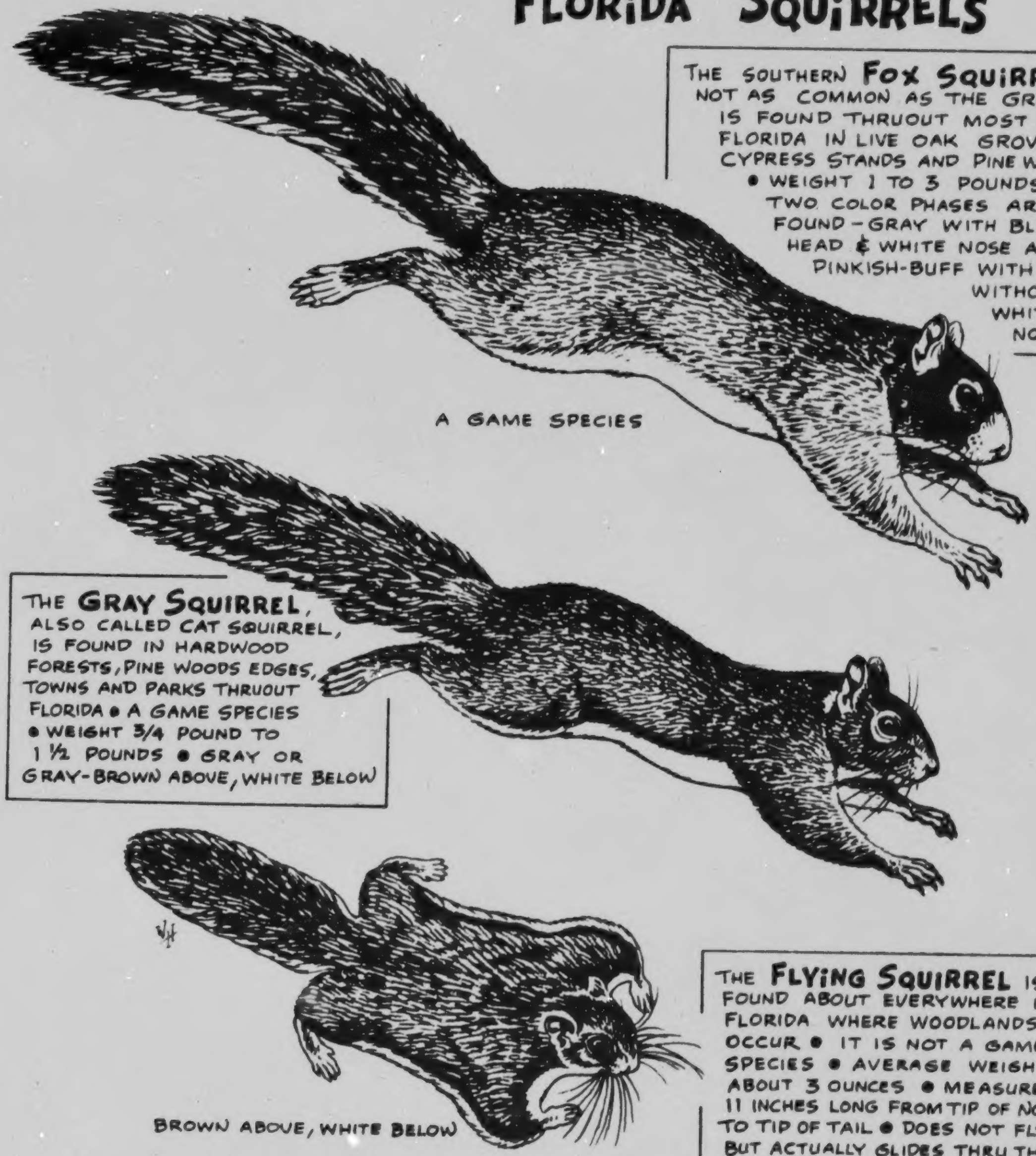
CALLED KITES BECAUSE OF THEIR BUOYANT FLIGHT - WITH ONLY SLIGHT MOVEMENT OF WINGS & TAIL SUDDENLY RISING HIGH IN THE SKY AND JUST AS SUDDENLY GRACEFULLY DIPPING BACK TO EARTH • THEIR FOOD INCLUDES LARGE INSECTS, SNAKES, LIZARDS, FROGS AND MICE, EXCEPT THE EVERGLADE KITE WHICH FEEDS EXCLUSIVELY ON THE LARGE SNAIL - AMPULLARIA

HAWKS ARE PROTECTED IN FLORIDA • PLEASE DO NOT SHOOT AT ANY SOARING, HAWK-LIKE BIRD!

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

What special adaptations do the kites have?
Kites are raptors. Name some other raptors.
The Everglades kite is an endangered species. Why? Is man morally bound to try to save the kite from extinction?
What does "Adapt or die" mean to you? What does it mean to the kite?

# FLORIDA SQUIRRELS



THE SOUTHERN **FOX SQUIRREL**, NOT AS COMMON AS THE GRAY, IS FOUND THRUOUT MOST OF FLORIDA IN LIVE OAK GROVES, CYPRESS STANDS AND PINE WOODS • WEIGHT 1 TO 3 POUNDS • TWO COLOR PHASES ARE FOUND - GRAY WITH BLACK HEAD & WHITE NOSE AND PINKISH-BUFF WITH OR WITHOUT WHITE NOSE

A GAME SPECIES

THE **GRAY SQUIRREL**, ALSO CALLED CAT SQUIRREL, IS FOUND IN HARDWOOD FORESTS, PINE WOODS EDGES, TOWNS AND PARKS THRUOUT FLORIDA • A GAME SPECIES • WEIGHT 3/4 POUND TO 1 1/2 POUNDS • GRAY OR GRAY-BROWN ABOVE, WHITE BELOW

THE **FLYING SQUIRREL** IS FOUND ABOUT EVERYWHERE IN FLORIDA WHERE WOODLANDS OCCUR • IT IS NOT A GAME SPECIES • AVERAGE WEIGHT ABOUT 3 OUNCES • MEASURES 11 INCHES LONG FROM TIP OF NOSE TO TIP OF TAIL • DOES NOT FLY, BUT ACTUALLY GLIDES THRU THE AIR FOR DISTANCES UP TO 150 FEET WITH THE AID OF MEMBRANES OF SKIN CONNECTING ITS FORE AND HIND LEGS • A NOCTURNAL ANIMAL - ACTIVE ONLY AT NIGHT

BROWN ABOVE, WHITE BELOW

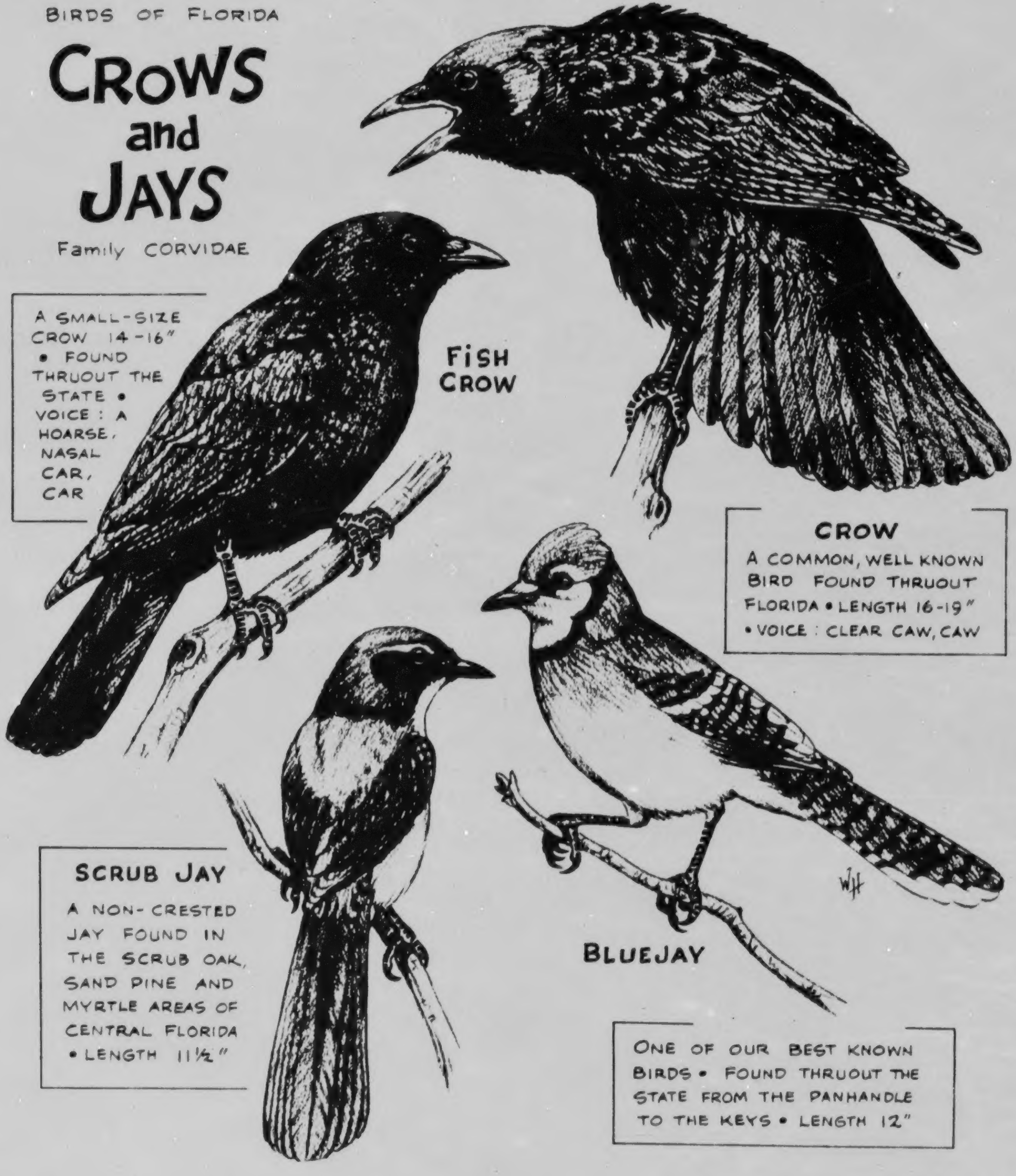
*— FLORIDA GAME AND FRESH WATER FISH COMMISSION*

How do Florida squirrels divide up habitats?
Demonstrate how the flying squirrel "flies."
Squirrels have many color phases. What advantages or disadvantages does this present?
What special adaptations do squirrels have for maintaining their populations?
Why do grey squirrels have both holes and leafy nests?

BIRDS OF FLORIDA

# CROWS and JAYS

Family CORVIDAE



**FISH CROW**

A SMALL-SIZE CROW 14-16" • FOUND THRUOUT THE STATE • VOICE: A HOARSE, NASAL CAR, CAR

**CROW**

A COMMON, WELL KNOWN BIRD FOUND THRUOUT FLORIDA • LENGTH 16-19" • VOICE: CLEAR CAW, CAW

**SCRUB JAY**

A NON-CRESTED JAY FOUND IN THE SCRUB OAK, SAND PINE AND MYRTLE AREAS OF CENTRAL FLORIDA • LENGTH 11½"

**BLUEJAY**

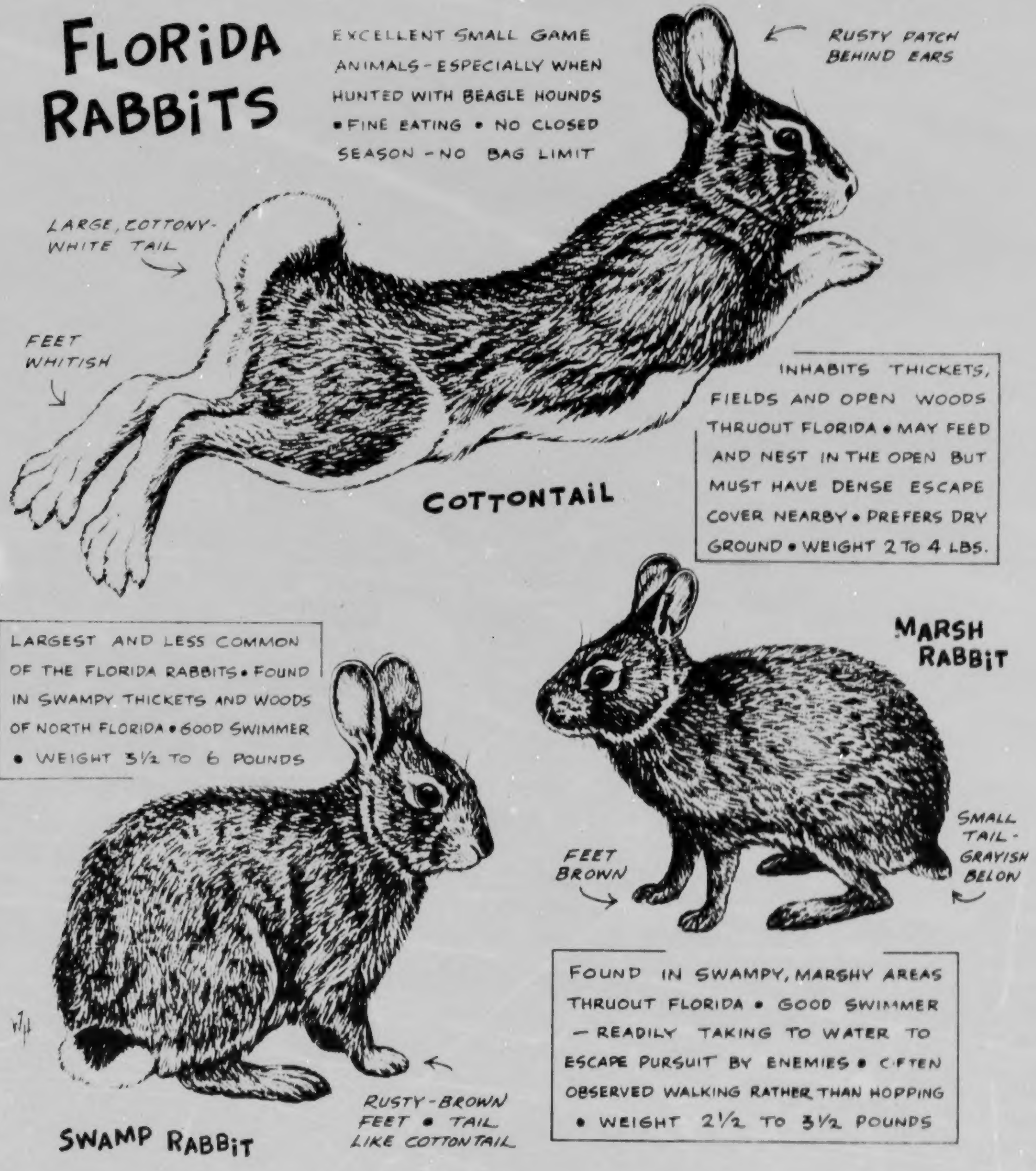
ONE OF OUR BEST KNOWN BIRDS • FOUND THRUOUT THE STATE FROM THE PANHANDLE TO THE KEYS • LENGTH 12"

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

Examine the food habits of crows. Would you label him a friend or foe?
How did the fish crow get his name?
Explain the role of the alarm calls of the blue jay.
The scrub jay is limited to a particular type of habitat. Why?

# FLORIDA RABBITS

EXCELLENT SMALL GAME ANIMALS - ESPECIALLY WHEN HUNTED WITH BEAGLE HOUNDS • FINE EATING • NO CLOSED SEASON - NO BAG LIMIT


RUSTY PATCH BEHIND EARS
LARGE, COTTONY-WHITE TAIL
FEET WHITISH
FEET BROWN
SMALL TAIL - GRAYISH BELOW
RUSTY-BROWN FEET • TAIL LIKE COTTONTAIL

**COTTONTAIL**

INHABITS THICKETS, FIELDS AND OPEN WOODS THRUOUT FLORIDA • MAY FEED AND NEST IN THE OPEN BUT MUST HAVE DENSE ESCAPE COVER NEARBY • PREFERS DRY GROUND • WEIGHT 2 TO 4 LBS.

**MARSH RABBIT**

FOUND IN SWAMPY, MARSHY AREAS THRUOUT FLORIDA • GOOD SWIMMER — READILY TAKING TO WATER TO ESCAPE PURSUIT BY ENEMIES • OFTEN OBSERVED WALKING RATHER THAN HOPPING • WEIGHT 2½ TO 3½ POUNDS

**SWAMP RABBIT**

LARGEST AND LESS COMMON OF THE FLORIDA RABBITS • FOUND IN SWAMPY THICKETS AND WOODS OF NORTH FLORIDA • GOOD SWIMMER • WEIGHT 3½ TO 6 POUNDS

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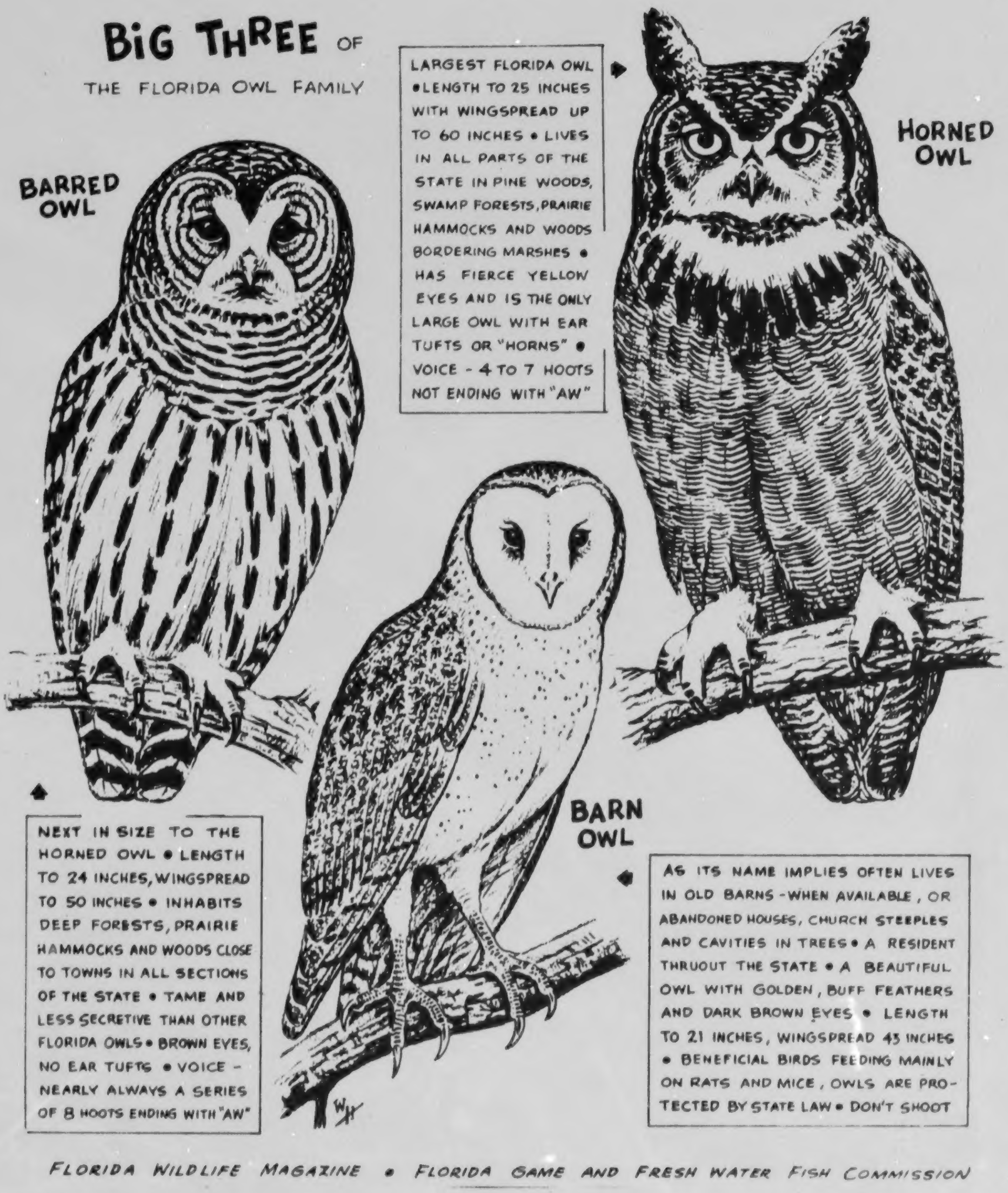
What special adaptations do rabbits have?

Since many carnivores prey on rabbits, why aren't they all eaten?

Marsh rabbits walk as well as hop. What are some other modes of animal locomotion? Act out all the types you can think of.

Find out how far a rabbit can jump. Work up a formula to show how far a rabbit jumps in proportion to body size. How far would a rabbit jump if his body was as large as yours?



# BIG THREE OF THE FLORIDA OWL FAMILY

**HORNED OWL**

LARGEST FLORIDA OWL • LENGTH TO 25 INCHES WITH WINGSPREAD UP TO 60 INCHES • LIVES IN ALL PARTS OF THE STATE IN PINE WOODS, SWAMP FORESTS, PRAIRIE HAMMOCKS AND WOODS BORDERING MARSHES • HAS FIERCE YELLOW EYES AND IS THE ONLY LARGE OWL WITH EAR TUFTS OR "HORNS" • VOICE - 4 TO 7 HOOTS NOT ENDING WITH "AW"

**BARRED OWL**

NEXT IN SIZE TO THE HORNED OWL • LENGTH TO 24 INCHES, WINGSPREAD TO 50 INCHES • INHABITS DEEP FORESTS, PRAIRIE HAMMOCKS AND WOODS CLOSE TO TOWNS IN ALL SECTIONS OF THE STATE • TAME AND LESS SECRETIVE THAN OTHER FLORIDA OWLS • BROWN EYES, NO EAR TUFTS • VOICE - NEARLY ALWAYS A SERIES OF 8 HOOTS ENDING WITH "AW"

**BARN OWL**

AS ITS NAME IMPLIES OFTEN LIVES IN OLD BARNS - WHEN AVAILABLE, OR ABANDONED HOUSES, CHURCH STEEPLES AND CAVITIES IN TREES • A RESIDENT THRUOUT THE STATE • A BEAUTIFUL OWL WITH GOLDEN, BUFF FEATHERS AND DARK BROWN EYES • LENGTH TO 21 INCHES, WINGSPREAD 43 INCHES • BENEFICIAL BIRDS FEEDING MAINLY ON RATS AND MICE, OWLS ARE PROTECTED BY STATE LAW • DON'T SHOOT

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

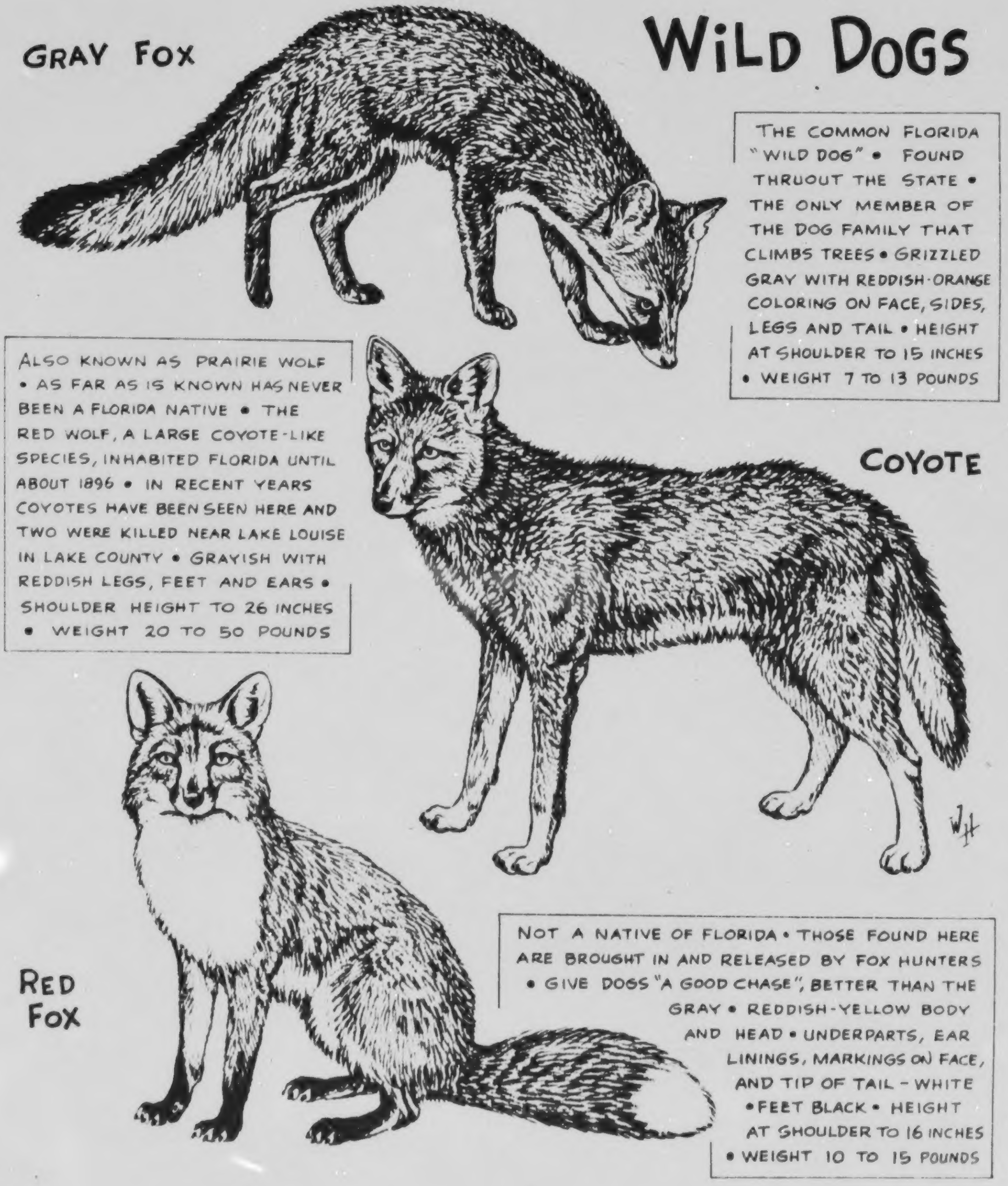
What special adaptations do owls have?

Owls and hawks use the same habitat at different times. What other animals share the environment in this way?

Explore the ways you could study owls in their natural habitats.

Owls are a symbol of wisdom. Why? Is the name "wise ol owl" justified?

# WILD DOGS



**GRAY FOX**

THE COMMON FLORIDA "WILD DOG" • FOUND THRUOUT THE STATE • THE ONLY MEMBER OF THE DOG FAMILY THAT CLIMBS TREES • GRIZZLED GRAY WITH REDDISH-ORANGE COLORING ON FACE, SIDES, LEGS AND TAIL • HEIGHT AT SHOULDER TO 15 INCHES • WEIGHT 7 TO 13 POUNDS

**COYOTE**

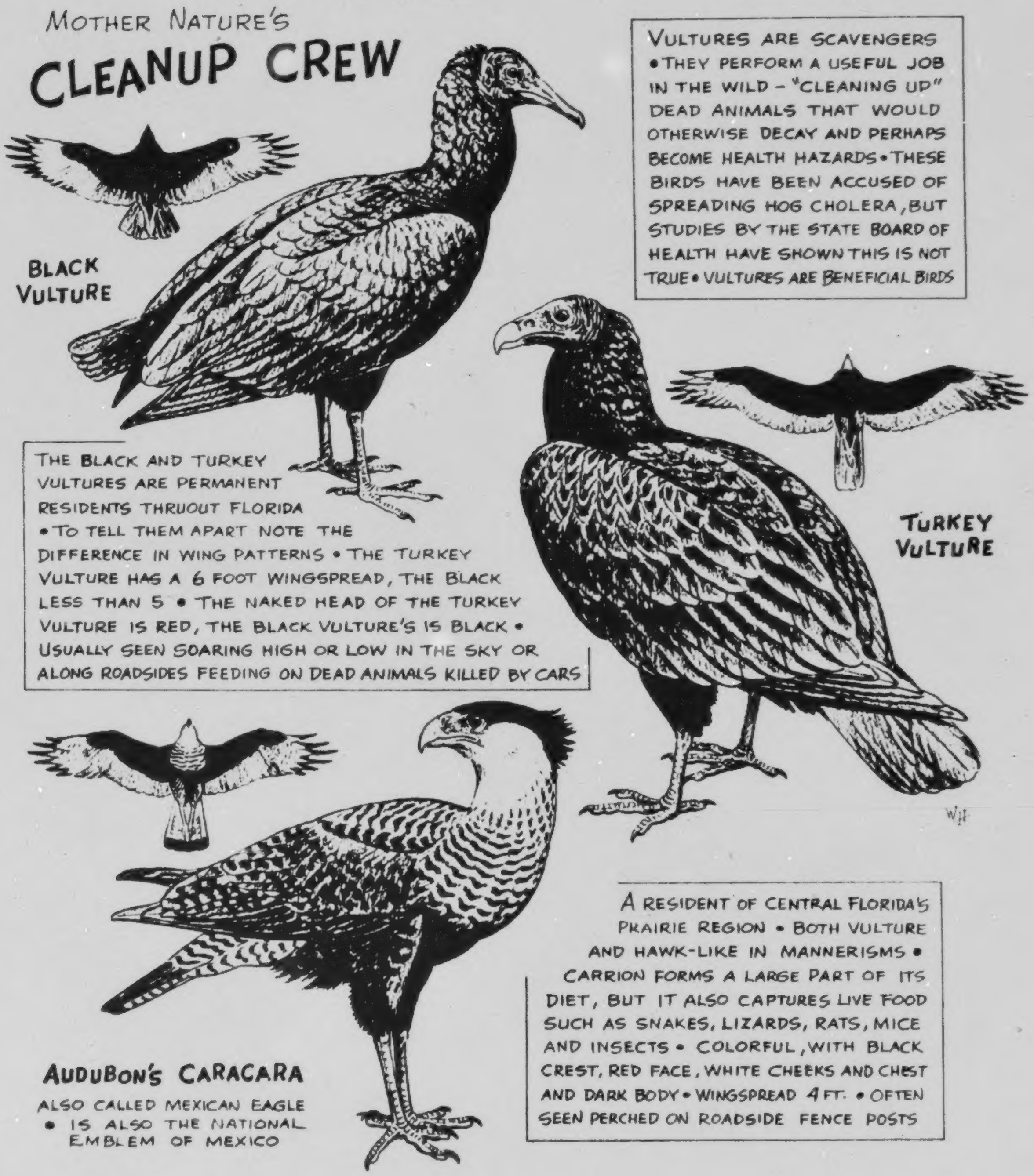
ALSO KNOWN AS PRAIRIE WOLF • AS FAR AS IS KNOWN HAS NEVER BEEN A FLORIDA NATIVE • THE RED WOLF, A LARGE COYOTE-LIKE SPECIES, INHABITED FLORIDA UNTIL ABOUT 1896 • IN RECENT YEARS COYOTES HAVE BEEN SEEN HERE AND TWO WERE KILLED NEAR LAKE LOUISE IN LAKE COUNTY • GRAYISH WITH REDDISH LEGS, FEET AND EARS • SHOULDER HEIGHT TO 26 INCHES • WEIGHT 20 TO 50 POUNDS

**RED FOX**

NOT A NATIVE OF FLORIDA • THOSE FOUND HERE ARE BROUGHT IN AND RELEASED BY FOX HUNTERS • GIVE DOGS "A GOOD CHASE", BETTER THAN THE GRAY • REDDISH-YELLOW BODY AND HEAD • UNDERPARTS, EAR LININGS, MARKINGS ON FACE, AND TIP OF TAIL - WHITE • FEET BLACK • HEIGHT AT SHOULDER TO 16 INCHES • WEIGHT 10 TO 15 POUNDS

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

How does the coloring differ among Florida's wild dogs? How does this adaptation relate to the places they live?
Coyotes are recent arrivals in Florida. Why have they expanded their range?
What advantages does the Grey Fox have as a tree climber? Does the Grey Fox have any special adaptations for this behavior?
Since all of Florida's Wild Dogs are carnivores, how do they divide up the food and space resources?



MOTHER NATURE'S

## CLEANUP CREW

VULTURES ARE SCAVENGERS • THEY PERFORM A USEFUL JOB IN THE WILD – "CLEANING UP" DEAD ANIMALS THAT WOULD OTHERWISE DECAY AND PERHAPS BECOME HEALTH HAZARDS • THESE BIRDS HAVE BEEN ACCUSED OF SPREADING HOG CHOLERA, BUT STUDIES BY THE STATE BOARD OF HEALTH HAVE SHOWN THIS IS NOT TRUE • VULTURES ARE BENEFICIAL BIRDS

**BLACK VULTURE**

THE BLACK AND TURKEY VULTURES ARE PERMANENT RESIDENTS THRUOUT FLORIDA • TO TELL THEM APART NOTE THE DIFFERENCE IN WING PATTERNS • THE TURKEY VULTURE HAS A 6 FOOT WINGSPREAD, THE BLACK LESS THAN 5 • THE NAKED HEAD OF THE TURKEY VULTURE IS RED, THE BLACK VULTURE'S IS BLACK • USUALLY SEEN SOARING HIGH OR LOW IN THE SKY OR ALONG ROADSIDES FEEDING ON DEAD ANIMALS KILLED BY CARS

**TURKEY VULTURE**

**AUDUBON'S CARACARA**

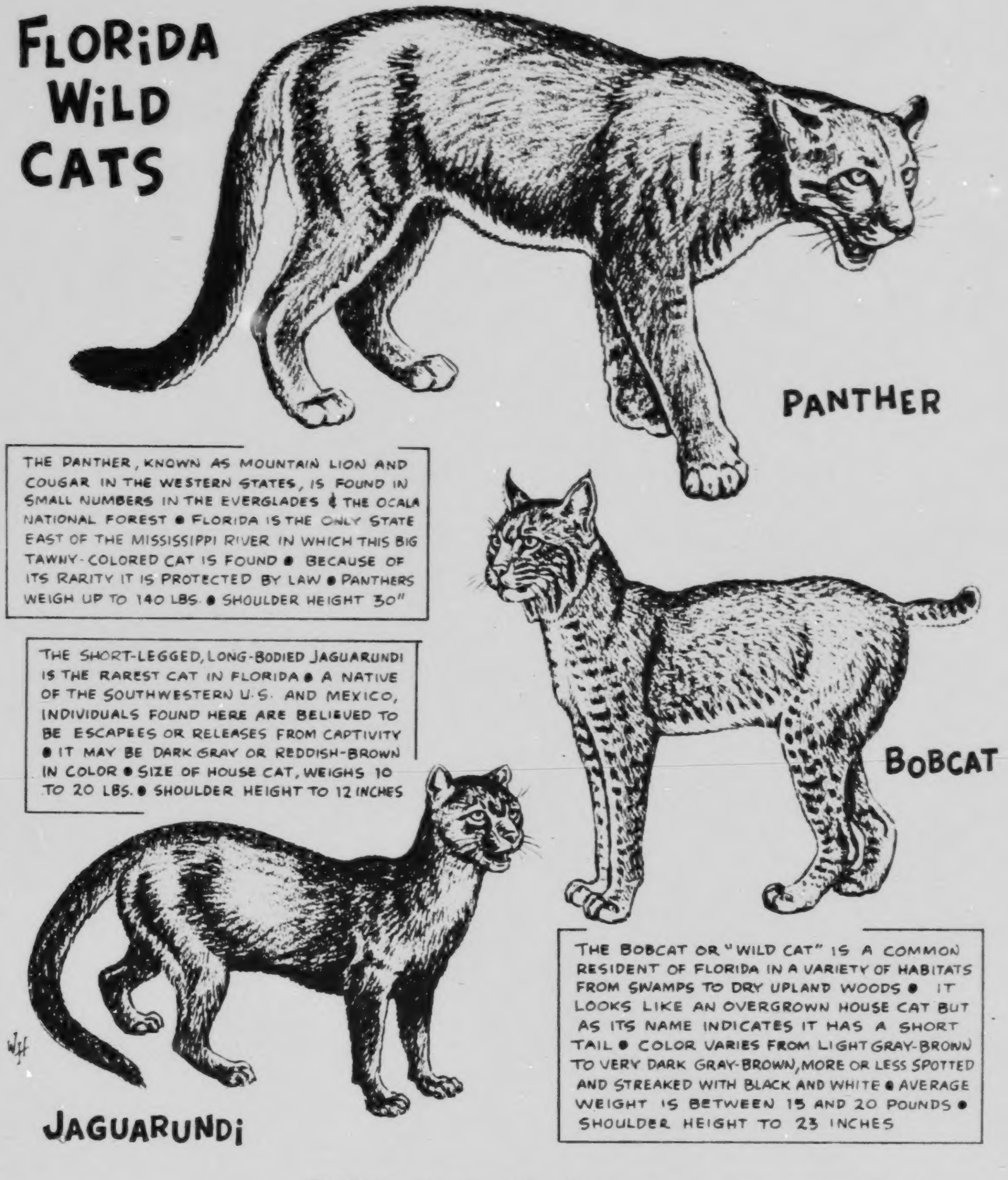
ALSO CALLED MEXICAN EAGLE • IS ALSO THE NATIONAL EMBLEM OF MEXICO

A RESIDENT OF CENTRAL FLORIDA'S PRAIRIE REGION • BOTH VULTURE AND HAWK-LIKE IN MANNERISMS • CARRION FORMS A LARGE PART OF ITS DIET, BUT IT ALSO CAPTURES LIVE FOOD SUCH AS SNAKES, LIZARDS, RATS, MICE AND INSECTS • COLORFUL, WITH BLACK CREST, RED FACE, WHITE CHEEKS AND CHEST AND DARK BODY • WINGSPREAD 4 FT. • OFTEN SEEN PERCHED ON ROADSIDE FENCE POSTS

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

Explain the ecological role of scavengers.
What are the differences between the black and the turkey buzzard?
Do you think you would like being a buzzard? Explain why or why not?
Buzzards and vultures are often associated with witchcraft. Why?
How can large birds, like buzzards, stay aloft for so long without flapping their wings?

# FLORIDA WILD CATS



**PANTHER**

THE PANTHER, KNOWN AS MOUNTAIN LION AND COUGAR IN THE WESTERN STATES, IS FOUND IN SMALL NUMBERS IN THE EVERGLADES & THE OCALA NATIONAL FOREST ● FLORIDA IS THE ONLY STATE EAST OF THE MISSISSIPPI RIVER IN WHICH THIS BIG TAWNY-COLORED CAT IS FOUND ● BECAUSE OF ITS RARITY IT IS PROTECTED BY LAW ● PANTHERS WEIGH UP TO 140 LBS. ● SHOULDER HEIGHT 30"

THE SHORT-LEGGED, LONG-BODIED JAGUARUNDI IS THE RAREST CAT IN FLORIDA ● A NATIVE OF THE SOUTHWESTERN U.S. AND MEXICO, INDIVIDUALS FOUND HERE ARE BELIEVED TO BE ESCAPEES OR RELEASES FROM CAPTIVITY ● IT MAY BE DARK GRAY OR REDDISH-BROWN IN COLOR ● SIZE OF HOUSE CAT, WEIGHS 10 TO 20 LBS. ● SHOULDER HEIGHT TO 12 INCHES

**BOBCAT**

THE BOBCAT OR "WILD CAT" IS A COMMON RESIDENT OF FLORIDA IN A VARIETY OF HABITATS FROM SWAMPS TO DRY UPLAND WOODS ● IT LOOKS LIKE AN OVERGROWN HOUSE CAT BUT AS ITS NAME INDICATES IT HAS A SHORT TAIL ● COLOR VARIES FROM LIGHT GRAY-BROWN TO VERY DARK GRAY-BROWN, MORE OR LESS SPOTTED AND STREAKED WITH BLACK AND WHITE ● AVERAGE WEIGHT IS BETWEEN 15 AND 20 POUNDS ● SHOULDER HEIGHT TO 23 INCHES

**JAGUARUNDI**

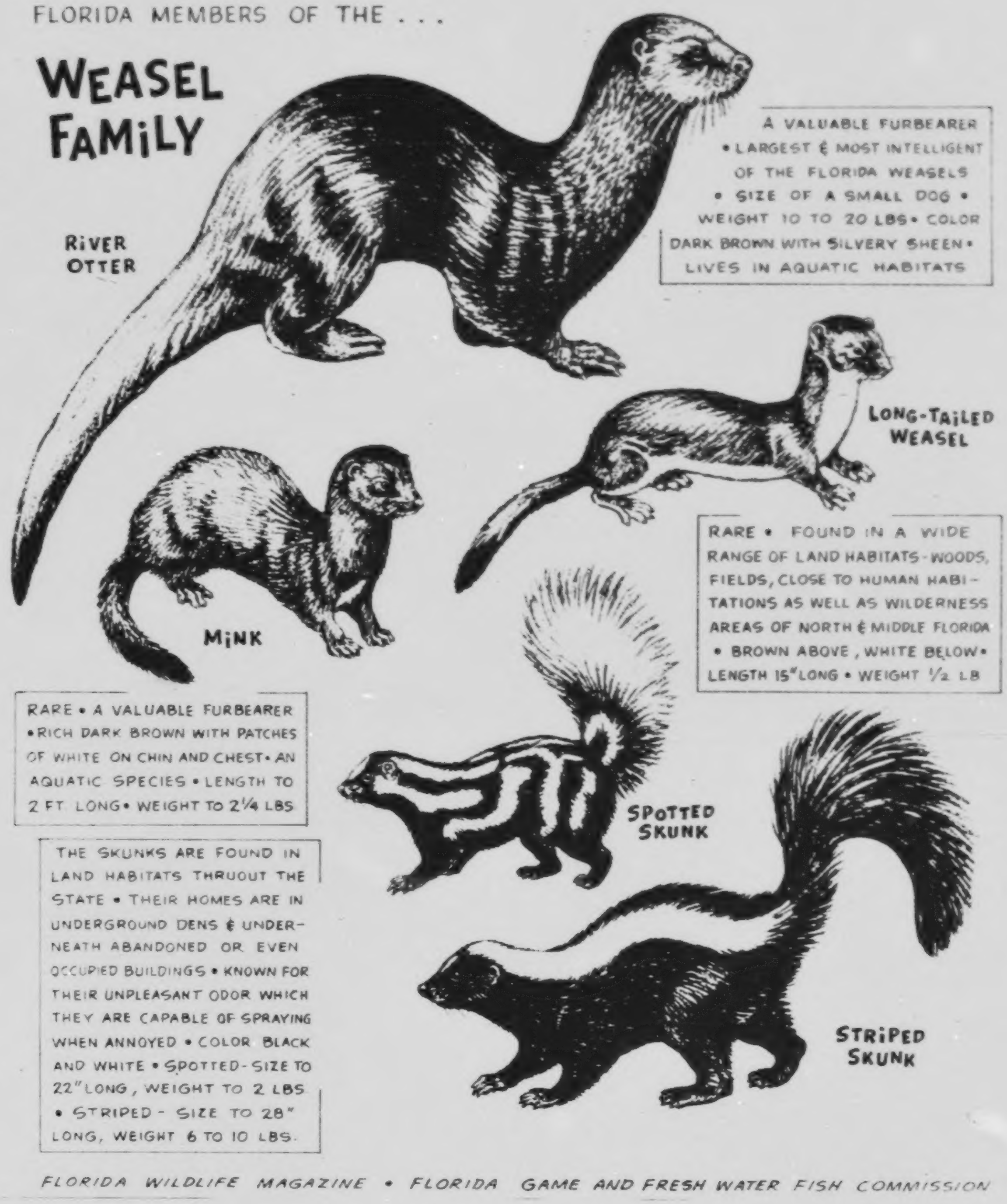
*FLORIDA GAME AND FRESH WATER FISH COMMISSION*

Compare and contrast the lifestyles of Florida wild cats and the wild dogs.

Wild cats make poor pets for a variety of reasons. Compare the temperament of wild cats with the domestic house pet.

Study the lifestyle of these three cats. Which would be best able to survive in a man-dominated environment?

Relate the body size of predators and their common prey using the cats as examples.



FLORIDA MEMBERS OF THE . . .

# WEASEL FAMILY

**RIVER OTTER**

A VALUABLE FURBEARER • LARGEST & MOST INTELLIGENT OF THE FLORIDA WEASELS • SIZE OF A SMALL DOG • WEIGHT 10 TO 20 LBS • COLOR DARK BROWN WITH SILVERY SHEEN • LIVES IN AQUATIC HABITATS

**LONG-TAILED WEASEL**

RARE • FOUND IN A WIDE RANGE OF LAND HABITATS - WOODS, FIELDS, CLOSE TO HUMAN HABITATIONS AS WELL AS WILDERNESS AREAS OF NORTH & MIDDLE FLORIDA • BROWN ABOVE, WHITE BELOW • LENGTH 15" LONG • WEIGHT 1/2 LB

**MINK**

RARE • A VALUABLE FURBEARER • RICH DARK BROWN WITH PATCHES OF WHITE ON CHIN AND CHEST • AN AQUATIC SPECIES • LENGTH TO 2 FT. LONG • WEIGHT TO 2 1/4 LBS

**SPOTTED SKUNK**

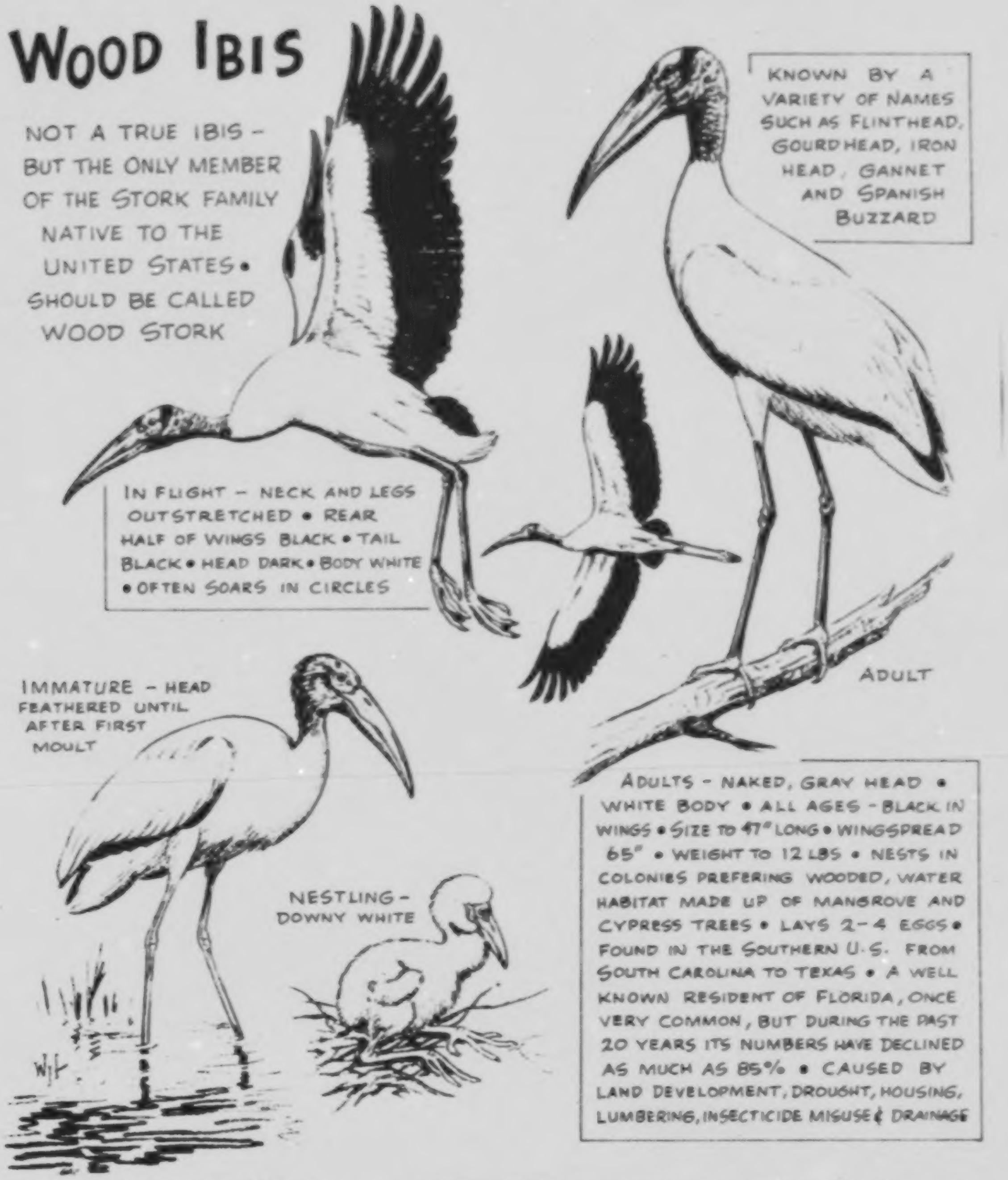
**STRIPED SKUNK**

THE SKUNKS ARE FOUND IN LAND HABITATS THRUOUT THE STATE • THEIR HOMES ARE IN UNDERGROUND DENS & UNDERNEATH ABANDONED OR EVEN OCCUPIED BUILDINGS • KNOWN FOR THEIR UNPLEASANT ODOR WHICH THEY ARE CAPABLE OF SPRAYING WHEN ANNOYED • COLOR BLACK AND WHITE • SPOTTED - SIZE TO 22" LONG, WEIGHT TO 2 LBS • STRIPED - SIZE TO 28" LONG, WEIGHT 6 TO 10 LBS.

*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

How does the weasel family divide up Florida's habitats? Prey animals?
Why is the long-tailed weasel so rare in Florida but common in the North?
What functions does the musk serve?
Explain the ecological significance of skunks!

# WOOD IBIS



NOT A TRUE IBIS - BUT THE ONLY MEMBER OF THE STORK FAMILY NATIVE TO THE UNITED STATES • SHOULD BE CALLED WOOD STORK

KNOWN BY A VARIETY OF NAMES SUCH AS FLINTHEAD, GOURDHEAD, IRON HEAD, GANNET AND SPANISH BUZZARD

IN FLIGHT - NECK AND LEGS OUTSTRETCHED • REAR HALF OF WINGS BLACK • TAIL BLACK • HEAD DARK • BODY WHITE • OFTEN SOARS IN CIRCLES

ADULT

IMMATURE - HEAD FEATHERED UNTIL AFTER FIRST MOULT

NESTLING - DOWNY WHITE

ADULTS - NAKED, GRAY HEAD • WHITE BODY • ALL AGES - BLACK IN WINGS • SIZE TO 47" LONG • WINGSPREAD 65" • WEIGHT TO 12 LBS • NESTS IN COLONIES PREFERING WOODED, WATER HABITAT MADE UP OF MANGROVE AND CYPRESS TREES • LAYS 2-4 EGGS • FOUND IN THE SOUTHERN U.S. FROM SOUTH CAROLINA TO TEXAS • A WELL KNOWN RESIDENT OF FLORIDA, ONCE VERY COMMON, BUT DURING THE PAST 20 YEARS ITS NUMBERS HAVE DECLINED AS MUCH AS 85% • CAUSED BY LAND DEVELOPMENT, DROUGHT, HOUSING, LUMBERING, INSECTICIDE MISUSE & DRAINAGE

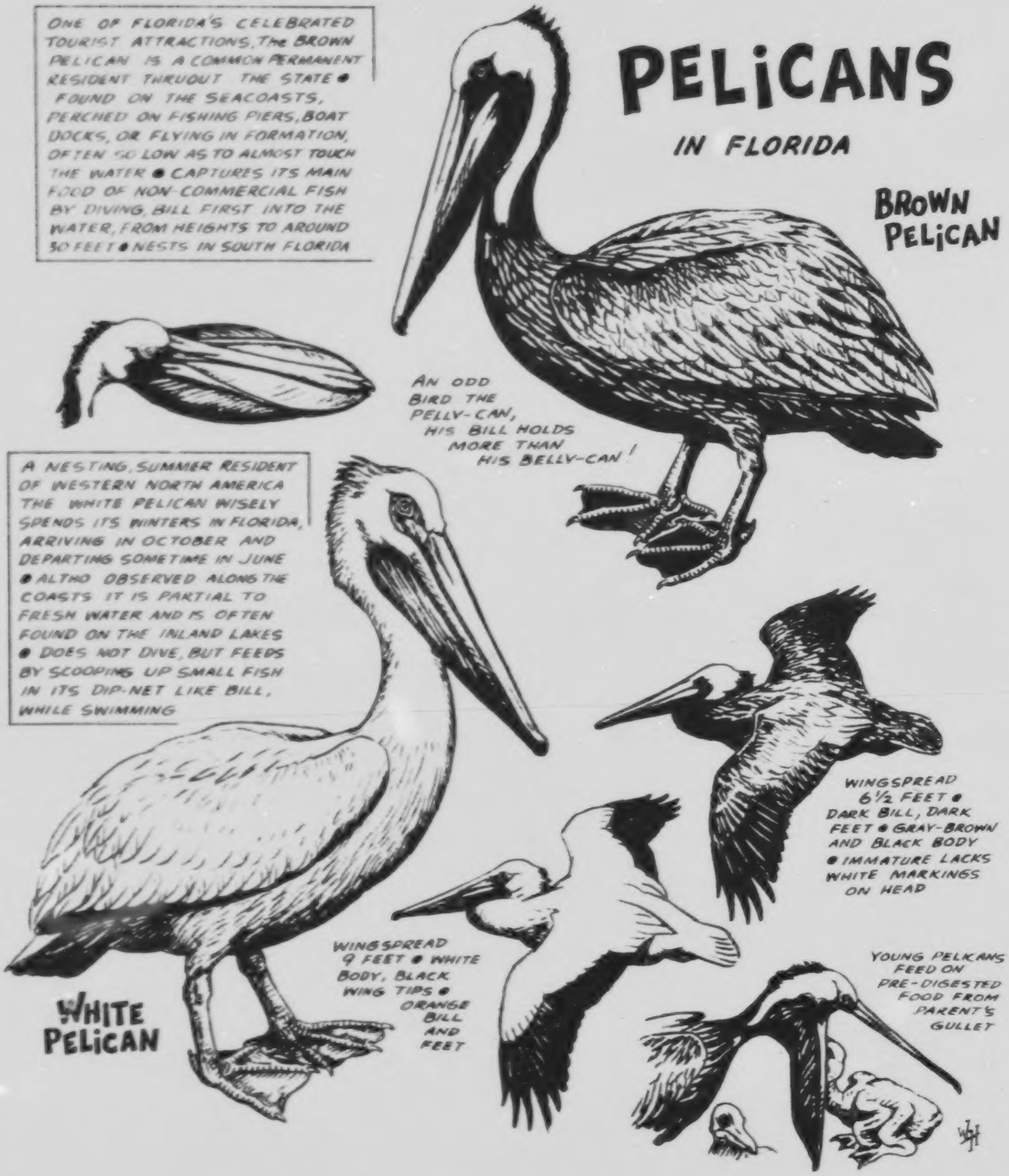
*FLORIDA WILDLIFE MAGAZINE • FLORIDA GAME AND FRESH WATER FISH COMMISSION*

Wood Storks are colonial nesters. How does this behavior affect their survival?

Naked heads are common in vultures and buzzards. Why does the Stork have this adaptation?

Suppose you had to choose between building a low-cost housing project and protecting a colony of Wood Stork. What factors would you examine before making a decision?

The nesting success of Wood Stork is closely linked to water levels and rainfall. Explore the ecological implications of this adaptation.



# PELICANS

## IN FLORIDA

**BROWN PELICAN**

ONE OF FLORIDA'S CELEBRATED TOURIST ATTRACTIONS, THE BROWN PELICAN IS A COMMON PERMANENT RESIDENT THRUOUT THE STATE ● FOUND ON THE SEACOASTS, PERCHED ON FISHING PIERS, BOAT DOCKS, OR FLYING IN FORMATION, OFTEN SO LOW AS TO ALMOST TOUCH THE WATER ● CAPTURES ITS MAIN FOOD OF NON-COMMERCIAL FISH BY DIVING, BILL FIRST INTO THE WATER, FROM HEIGHTS TO AROUND 30 FEET ● NESTS IN SOUTH FLORIDA

AN ODD BIRD THE PELLY-CAN,
HIS BILL HOLDS MORE THAN
HIS BELLY-CAN!

**WHITE PELICAN**

A NESTING, SUMMER RESIDENT OF WESTERN NORTH AMERICA THE WHITE PELICAN WISELY SPENDS ITS WINTERS IN FLORIDA, ARRIVING IN OCTOBER AND DEPARTING SOMETIME IN JUNE ● ALTHO OBSERVED ALONG THE COASTS IT IS PARTIAL TO FRESH WATER AND IS OFTEN FOUND ON THE INLAND LAKES ● DOES NOT DIVE, BUT FEEDS BY SCOOPING UP SMALL FISH IN ITS DIP-NET LIKE BILL, WHILE SWIMMING

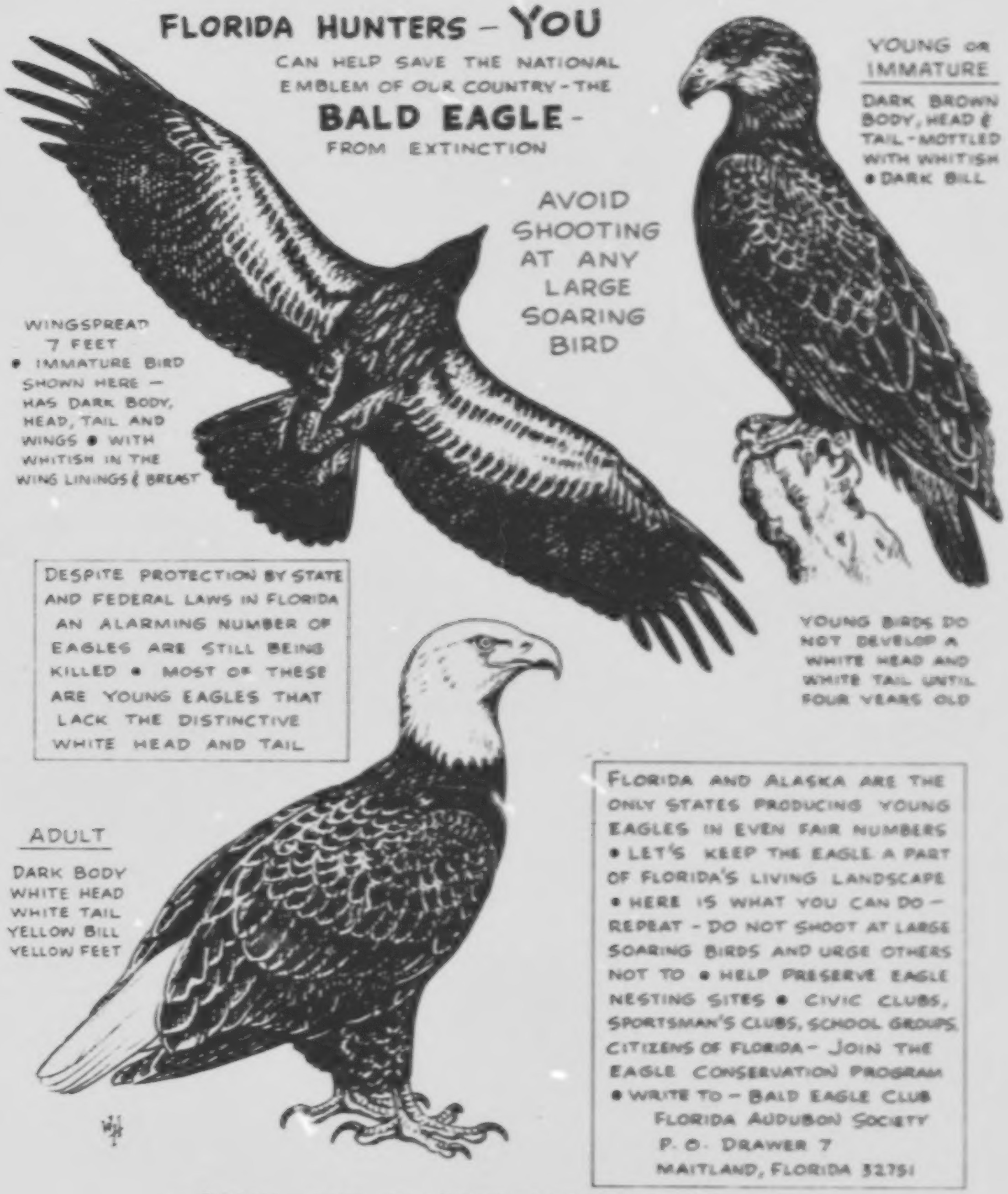
WINGSPREAD 6½ FEET ● DARK BILL, DARK FEET ● GRAY-BROWN AND BLACK BODY ● IMMATURE LACKS WHITE MARKINGS ON HEAD

WINGSPREAD 9 FEET ● WHITE BODY, BLACK WING TIPS ● ORANGE BILL AND FEET

YOUNG PELICANS FEED ON PRE-DIGESTED FOOD FROM PARENT'S GULLET

– FLORIDA GAME AND FRESH WATER FISH COMMISSION

What are some of the reasons Pelicans are considered an endangered species?
What are some adaptations Pelicans have for their unique lifestyle?
How did the strange procedure for feeding young evolve in Pelicans?
What are some special hazards that Pelicans must contend with?



# FLORIDA HUNTERS – YOU

CAN HELP SAVE THE NATIONAL EMBLEM OF OUR COUNTRY – THE

**BALD EAGLE** –

FROM EXTINCTION

AVOID SHOOTING AT ANY LARGE SOARING BIRD

YOUNG OR IMMATURE

DARK BROWN BODY, HEAD & TAIL – MOTTLED WITH WHITISH • DARK BILL

WINGSPREAD 7 FEET • IMMATURE BIRD SHOWN HERE – HAS DARK BODY, HEAD, TAIL AND WINGS • WITH WHITISH IN THE WING LININGS & BREAST

DESPITE PROTECTION BY STATE AND FEDERAL LAWS IN FLORIDA AN ALARMING NUMBER OF EAGLES ARE STILL BEING KILLED • MOST OF THESE ARE YOUNG EAGLES THAT LACK THE DISTINCTIVE WHITE HEAD AND TAIL

YOUNG BIRDS DO NOT DEVELOP A WHITE HEAD AND WHITE TAIL UNTIL FOUR YEARS OLD

ADULT

DARK BODY
WHITE HEAD
WHITE TAIL
YELLOW BILL
YELLOW FEET

FLORIDA AND ALASKA ARE THE ONLY STATES PRODUCING YOUNG EAGLES IN EVEN FAIR NUMBERS • LET'S KEEP THE EAGLE A PART OF FLORIDA'S LIVING LANDSCAPE • HERE IS WHAT YOU CAN DO – REPEAT – DO NOT SHOOT AT LARGE SOARING BIRDS AND URGE OTHERS NOT TO • HELP PRESERVE EAGLE NESTING SITES • CIVIC CLUBS, SPORTSMAN'S CLUBS, SCHOOL GROUPS, CITIZENS OF FLORIDA – JOIN THE EAGLE CONSERVATION PROGRAM • WRITE TO – BALD EAGLE CLUB

FLORIDA AUDUBON SOCIETY
P. O. DRAWER 7
MAITLAND, FLORIDA 32751

*– FLORIDA GAME AND FRESH WATER FISH COMMISSION*

How and why was the eagle chosen to be our nation's symbol?
Why are bald eagle populations declining?
Do you think it is important to save the eagle? Why?
Eagles and osprey often nest side by side. How do they keep from competing with each other?

# cre'a·tiv'i·ty

## IN ENVIRONMENTAL EDUCATION

Try to write a short paragraph, as whimsical as possible, using all the words listed below. Only verbs, prepositions and articles can be added.

Parking meter
Gyroscope
Man
Derrick
Capsule
Magnificent
Woman
Flower Power
Philanthropic

Igloo
Shopping cart
Strange
Manicure
Television
Ancillary
Mastodon
Staircase
Pumpkin

Prepared by

Kit Bieschke
Jim Callahan
Ricky Keith
Yolanda Hanna

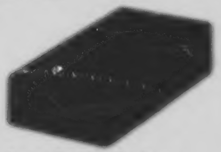
Tallahassee Adult Literacy
Council

With the Project Staff

March, 1975

# FOSTERING CREATIVITY IN ENVIRONMENTAL EDUCATION

**How many uses can you think of . . .**



**for a brick (in two minutes)?**

*Creative thinging involves expressing thoughts and feelings in original ways. For a learner, creative thinking may be a new interpretation, a grasp of new relationships of phenomena, an original synthesis or expression of ideas, a new proposal or hypothesis, a new way of doing something.*

--Edwin Fenton

*The creative process in the emergence in action of a novel relational product, growing out of the individual on the one hand, and the materials, events, people, or circumstances of his life on the other.*

--Carl Rogers

*Creativity is a process in the individual; to the extent that a person makes, thinks, of something that is new to him, he may be said to have performed a creative act.*

--Margaret Mead

*Creativity is an act that produces effective surprise.*

--Jerome Bruner

Creativity goes beyond awareness of what is to a deeper sense of what might be. Decision-making and "problem-solving" depend upon creativity and environmental education offers a multitude of opportunities for creative activities, all stressing perceptions of what might be.

Two distinct approaches to a definition of creativity emerge from research. The first, which may be called "creative cognition," means discovering anew and for one's self those innovations which have previously been identified and verified by others. Every time a student "discovers" the validity of a Euclidean theorem or a generalization about human behavior, for example, he is engaged in creating anew, for himself, the cognitions which link together a myriad of perceptions. When the student leaps to a new hypothesis, perceives a range of alternatives open to an actor in an ethics case, discovers new analogies to a case study under study, he is engaged in creative cognition.

A second approach to creativity, however, emerges from the arts and humanities. Here creativity is perceived as making or doing something which expresses one's personal understanding of his world. It makes use of the individual's imagination, his ability to fantasize and express his private perspectives to others via art, music, drama, stories, poetry, dance, or invention. Since this understanding of creativity involves expressing personal meaning by making or doing something, it might be called "kinetic creativity."

## Creative Cognition

The first function of creative cognition involves the ability to *lay out* alternatives. For example, given traffic congestion in an inner city area, students might be asked to devise new traffic patterns and alternatives to cars in the center city. Given an interest in a historic landmark no longer in use and threatened by bulldozers, students might be asked to lay out uses for the old building in order to save it.

While the perception of increasing numbers of alternatives open in conflict situations is a critical factor in moral development, so is the ability to *formulate new hypotheses* for testing against the available evidence. Students are regularly involved in predicting the consequences of alternatives. These predictions demand that students form hypotheses. If we bomb Peking, what will happen? What evidence do I have to predict the Chinese response? Better, what ways are open where I can accomplish our national objectives without any bombing? What are the expected results of these alternatives? In another ethical arena, students might be trying to predict what an employer might do if workers opt not to dump industrial wastes into the river as ordered by a foreman. They hypotheses which students form here are creative acts.

A third function of creative cognition is the ability to *generate analogies*. Analogies function in ethical discourse as a tool to extend an argument or to rebut it. For example, in deciding a privately-owned rooming house case involving rights to private property and rights to equality, a student might opt for rights to equality. Another student, challenging that argument, might switch the subject from rooming houses to Castro's takeover of private U.S. corporations' land and mineral holdings in the early 1960s to see if the first student maintains his preference for rights to equality in the value conflict.

## Kinetic Creativity

Environmental education should provide many opportunities to develop kinetic creativity. Given a stimulus object (painting, photograph, quotation, etc.), students might be asked to imagine a fantasy using that object and setting forth what *might be*: the cleaning of a stream, the restoration of an old building, really beating swords into plowshares, and so forth. Students might be asked to design murals for old buildings, creative play equipment for urban mini-parks, a dance to celebrate a victory over pollution, and "wanted posters" for five urban villains.

Activities should spark students' imagination and with their teachers they may devise their own creative activities. One student group designed environmental "trust walks" to explore their school environment, blindfolded and barefooted --to feel their space with a heightened sense of smell, feeling, and hearing. Another group wrote poems and songs on natural beauty. Still another group cleaned a beach in Pinellas County, Florida, and used much of the trash in "environmental junk" art: candle holders, posters, trash cans, ash trays, statues, mobiles, etc. Theirs was an exciting and useful bit of kinetic creativity!

## CREATIVITY IN THE CLASSROOM

There is no guarantee that THE CREATIVE PERSON, writ with capital letters, can be molded or nurtured by classroom instruction--in fact, there are those who would argue that the classroom destroys more creativity than it spawns. Environmental educators can, however, support and foster creative responses and products from students. They may make conditions favorable and provide opportunities for students to develop their cognitive and kinetic creativity. And, perhaps most important, educators can serve as creative models.

Inquiry demands creative hypotheses, creative responses to social problems, and imaginative projection of alternatives open in value conflict situations. Such creativity is to be prized in the classroom and in the society. However, educators may have neglected more imaginative, intraceptive creative responses--relegating them to special curriculum areas such as the choral room, the band concert, the art room, and the drama class. It is an argument of this paper that creative opportunities should be extended to students in all areas of the curriculum, including environmental education.

A classroom process for evoking creative responses is outlined below:*

1. Warm-up and involvement in a problem, task, or situation. This places the coming task in perspective for the instructional unit, and makes the coming task relevant and meaningful to the ongoing work of the course and to the concerns of the students.

2. Problem, task, or challenge. The teacher presents a situation needing a creative response, or the students identify such a concern. The effort here is directed toward arousing dissonance--a perplexity, tension, or curiosity.

3. Initial statement of the task, or problem, by the students as they search for an appropriate response. The classroom climate is established here, if this is a group task. The teacher should make certain that the atmosphere is free from threatening peer evaluation.

4. Alternative responses. Students cope with the problem or task as they see it, producing alternative responses, suggesting, trying, imagining, testing the knowledge and techniques they come up with. Manipulation, introspection, speculation, and fantasizing are appropriate here. The length of time spent in this stage would vary greatly with student interest, the type of task, and the students' success.

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*See Byron G. Massilias and Jack Zevin, Creative Encounters in the Classroom. (New York: John Wiley & Sons, 1967).

5. Evaluation and communication of the result. The final stage in the sequence involves students in the rigorous testing of their ideas or in the appraisal of their products.

The teacher seeking to elicit creative responses from students might try some of the following strategies prior to a lesson, assignment, or other learning activity.*

The strategies were removed to conform with copyright laws.

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*From E. Paul Torrance and R.E. Myers, Creative Learning and Teaching (New York: Dodd, Mead & Company, 1970), pp.54-55.

## A COLLAGE OF SUCH ACTIVITIES FOR ENVIRONMENTAL EDUCATION

### Creative Rebuttal

The following list contains a number of value principles. Read carefully, then with a small group of friends, think up a situation (real or imagined, historical or current), which contradicts or is an exception to the principle.

1. Governments that govern least, govern best.
2. Politicians should never lie.
3. We should all obey the law.
4. Each person is entitled to an equal share of what is necessary to sustain life.
5. Majority decisions ought to be binding on all matters of public policy.

### WARM-UPS

1. Zoo Story. Think about the main features of a zoo. Write a short story or several paragraphs comparing and contrasting your area with those features of a zoo.
2. Grouping. Think about the people in your "natural" area. Into how many groups can you divide the people in your area?

Black -- White
Young -- Old
Liberal -- Conservative
________ ________
________ ________

Look at a map of your county. How has the land-use pattern divided people?

______________________________________________________________
______________________________________________________________
______________________________________________________________

## PRODUCTS

1. In ancient Athens, citizens took the following oath:

> The Athenian Oath: "...we will strive unceasingly to quicken the public sense of public duty; that thus... we will transmit this city, not only not less, but greater, better and more beautiful than it was transmitted to us."

Write an oath for residents of your area in the 1970s:

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

2. Build a Bulletin Board of current events from your area -newspaper articles could be cut out in shapes of people, buses, buildings, etc. (the article itself could be shown by bordering it with magic markers.)

3. Making a Collage on life in your area. Topics might be:
   1. people (doing things, e.g., shopping, working)
   2. traffic jam, pollution
   3. an overall collage about the quality of life

4. You are in the business of advertising. Find out what your county has that a visitor would want to do or see. Make a booklet to advertise those things, inviting people to visit the county.

5. You have just returned from visiting another city on vacation. Make a little display telling us and showing us what you did and saw. This display should make the city interesting enough to make us want to visit the city too.

6. You work for an airline company. You have been asked to advertise a city for them. Make a travel poster to invite people to visit your county.

7. Writing a list of words for:
   - -a poem,
   - -a story, or
   - -a newspaper article.

   -give an opening line for a poem
   - i) To the Museum I'll travel and there I'd see
   - ii) I have a friend in nature
   - iii) The Junior Museum! What is it? I think I know. It is....

   -give a title for a story
   - i) Sounds of Nature
   - ii) Lost in Nature
   - iii) Shapes of Nature
   - iv) People in Nature
   - v) Where Has All the County Gone in Our Area?

-suggest a situation for a newspaper article.

- i) cars are no longer allowed downtown
- ii) museums for children, fun and beauty
- iii) trees have rights too
- iv) fantastic swamps

8. Emma Lazarus wrote the following poem about the Statue of Liberty in 1883. It was hoped that the poem would help raise money to put up the statue in New York Harbor. The monument was completed in 1886. This poem was inscribed on the base of the statue in 1908:

The New Colossus

Not like the brazen giant of Greek fame,
With conquering limbs astride from land to land;
Here at our sea-washed, sunset gates shall stand
A mighty woman with a torch, whose flame
Is the imprisoned lightning, and her name
Mother of Exiles. From her beacon-hand
Glows world-wide welcome; her mild eyes command
The air-bridged harbor that twin cities frame.
"Keep ancient lands, your storied pomp!" cries she
With silent lips. "Give me your tired, your poor,
Your huddled masses yearning to breathe free,
The wretched refuse of your teeming shore.
Send these, the homeless, tempest-tost to me,
I lift my lamp beside the golden door!"

Write a poem or song expressing your feelings about new residents who plan to move into your county between now and the year 2000 AD.

9. One author wrote the following paragraphs about urban areas:

> "The large city has outlived its usefulness. New York, for example, features overcrowding, inadequate municipal services, air and water pollution, crime in the streets, ethnic clashes, and widespread poverty. Even its cultural life is artificial, for it is restricted to the educated few, and it drains the rest of America of its promising young talent. It is a bad place to live; it's even becoming a bad place to visit." To what degree is this assessment a fair one?

Write a speech to express your agreement or disagreement with her judgment.

10. How does the physical plant of the Junior Museum lend itself to the "natural" atmosphere of the grounds? What considerations did the architect make when he was designing these buildings?

If you were to redesign the museum, how would you change it? Construct a model of your proposed design.

11. Locate something decomposing and/or thrown away and find another "use" for it.

12. Plan a community in this setting: how would you take care of waste, power, schools and other community needs? Divide the class into small groups and have each group design a community of a given size, then have the groups compare their ideas and priorities.

13. Have a contest in your classroom or school to see what the students could create using things which are usually "thrown away" such as egg cartons, plastic jelly holders from restaurants, milk cartons. (Example: take the jelly holders to the elementary schools and they can be used to hold paint, cartons could be used to hold brushes, etc...)

14. Take the children outside. Have them observe the trees. Notice the different kinds of trees, the colors, etc. When you get back inside ask the children to write a story about the things that might happen to the tree.

15. Ask the kids to think for a minute about what America was like in 1875. Look at the changes in our environment that have taken place since then. Now write a short story telling about what changes will occur by 2075 and how these changes will affect the environment.

16. Draw a picture of an environmental villain. It can be anything that harms our environment. Write a paragraph explaining why you chose a particular villain.

17. Have the children view these films and write a short story or poem telling how the ideas in the films affect their environment.

| Title | Leon County School System Order # |
|---|---|
| The Treehouse | 2012 |
| Down Decibel Down | 2297 |
| Standing Room Only | 1146 |
| The Garbage Explosion | 124 |
| The Drowning Bay | 2296 |

18. Pretend you are writing a book about your environment. Write the title you would use for the book and a short statement of what it would contain.

19. Dramatize a source of pollution that you see frequently? Example: people throwing litter.

20. Pretend you are a fish in a polluted lake. Dramatize what your life would be like. Next, dramatize how your life is affected by your environment.

21. Using four colors (crayons, chalk, etc.), draw a picture that expresses how you feel about your nature. Discuss your drawing with the rest of the class. "What does it mean to you?" "How does it express your views?"

BRAINSTORMING, a process whose name has become a colloquialism, was developed by Alex F. Osborn. It uses a classroom type set-up, with a leader who clearly states the problem and then asks participants to make any suggestion that seems relevant. During this free association response nothing is rejected or criticised; every suggestion is written down for later evaluation. The "piling up of alternatives" (a metaphoric device) gives vent to creative solutions. "In brainstorming," says Osborn, "quality may be a function of quantity. In case after case, the last ideas produced at a brainstorming session have averaged higher in quality than the first fifty."

(REFERENCE: "APPLIED IMAGINATION," BY ALEX F. OSBORN)

1. Brainstorming. What are possible products of creativity?

banners
songs
logos
displays
speeches
rituals, rites
__________
__________

poetry
stories
models
designs
symbols
dance
__________
__________

ads
sculpture
bulletin boards
murals
commercials
posters
__________
__________

grafitti
lists
cartoons
collages
name tags
paintings
booklets/books
__________etc.

What are the conditions of the creative attitude, of seeing and responding, of being aware and being sensitive to what one is aware of? First of all, it requires the capacity to be puzzled. Children still have the capacity to be puzzled . . . But once they are through the process of education, most people lose the capacity of wondering, of being surprised. They feel they ought to know everything, and hence that it is a sign of ignorance to be surprised or puzzled by anything.
ERIC FROMM

2. Brainstorm some solutions to beautifying the playground or a nearby park. Implement some of the ideas. Paint a fence, plant some flowers, rake the sandlot, plant millet or rye for the birds.

3. Find a picture of some natural environment. With your group examine the picture and list as many words or impressions which come to mind. Take one thought or feeling and ask each person to write a short story. Share your stories.

4. Find a tree and talk about its life. What sort of life has this tree known before you found it? What other life forms (plants and animals) has this tree known? What sort of relationship went on with these other life forms (friends, enemies)? What could happen to this tree in the future? Brainstorm a list of possibilities.

5. Identify an environmental problem. Brainstorm possible solutions to the problem. For example, a problem might be wasted paper at MacDonald's hamburger joints. Brainstorm uses for "Big Mac" boxes.

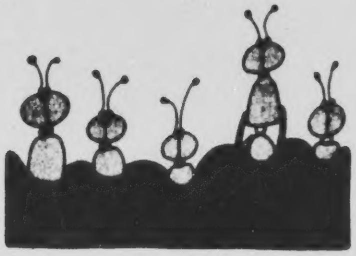
SYNECTICS, a technique created by William J. J. Gordon, is like a mental pinball game. Innovative solutions to a specific problem are sought through a process of consciously reversing the order of things and "making the strange familiar and the familiar strange." Requiring an experienced leader, the synectic session is a lively and dynamic flanking maneuver in which rational, obvious solutions are abandoned for what might seem irrelevant, even bizarre approaches. Members of the group act like flints, igniting sparks in other members with their offbeat approaches. As Gordon describes it, "When the familiar is made strange and involvement with the strange is achieved, the result is the excitement of a high-energy state. The control of this creative energy is implicit in the oscillating motion between involvement and detachment." Verbally, this "involvement and detachment" occurs through four basic types of analogy, explained below.

(REFERENCE: "SYNECTICS: THE DEVELOPMENT OF CREATIVE CAPACITY," BY WILLIAM J. J. GORDON)

**(1) PERSONAL ANALOGY, that is, identifying oneself or someone else with an object or process. This loss of identity allows the individual to imaginatively assume the identity of something inanimate in order to get a new viewpoint on the problem.**
**"If I were a flywheel, how would I react if that kind of force were applied?"**

**(2) DIRECT ANALOGY is used to make an actual comparison between parallel facts in different disciplines. Such a juxtaposition may lead to new understanding of the problem.**
**"For a desalinization process, could we learn something from how a seagull lives on salt water?"**

**(3) SYMBOLIC ANALOGY uses an image which, although technically inaccurate, is aesthetically satisfying as a way of looking at the problem. It is a unique association of metaphors, complete for the moment and thus unassailable.**
**"Imagine a rope that would stiffen like a bicycle chain to hold up something."**



**(4) FANTASY ANALOGY makes the improbable connection between the world as we know it and one where anything is possible as long as it can be imagined. Within this pattern anything is valid regardless of known natural and physical laws.**
**"If we used trained ants for numbers, what kind of self-powered desk calculator could we build?"**

1. How is. . .

A spider's web like a natural habitat?
A bird like DDT?
An umbrella like a tree?
The earth like a filter?
The sun like a heater?
Collecting rocks like stealing?
Collecting butterflies like Hitler?
An environmental impact statement like baseball?
A squirrel like the Rockefellers?
The web of life like a bureaucracy?

2. Pretend you are a doctor and your environment is your patient. What would you prescribe to make your place feel better? What operations would you perform? Is there any hope of saving the patient? How much would it cost? Dollars? Sweat?

3. Collect one item from the environment that the people could eat like a grass stem or a mulberry. Ask your group to close their eyes and eat the item you give them. Later ask them how they felt about the experience, and to identify what was eaten? Ask them how they arrived at the identity of the item?

4. What environmental object, event or process do you associate with the following words:

villain
hard
peaceful
producing
costly
trust
happy
polluted
wasted
hungry
aggression
dirty
fear
rotten
_______
love
sad
tender
soaring
_______etc.

5. Do a little fantasy surrounding these "What If" situations:

What if people didn't die?
What if trees were stone?
What if birds got tired of eating insects?
What if cars were ecologically safe?
What if there was no litter?
What if you had to produce your own food?
What if you had to dispose of your own trash and waste?

6. Find some music and make some sounds which are: happy; sad; angry; soaring; busy; slow; polluting; relaxing.

**Does each grouping of two things suggest a third in which elements of both are combined? How many "third things" can you derive from each grouping? Try drawing them or writing words for them in the blank spaces, being as original as possible.**

| | | | | | |
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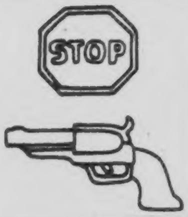
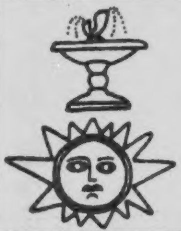
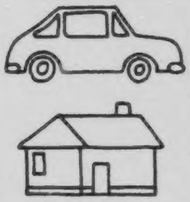
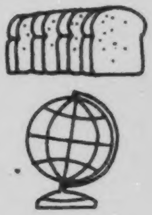
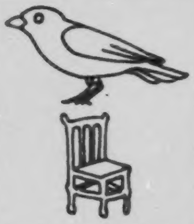
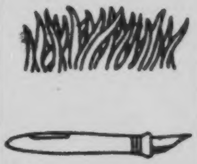
|  |  |  |  |  |  |
| Example:<br>Dead-end | | | | | |

## Lifestyle Decisions

Divide your group into three sub-groups. Place each sub-group into a "situation" as described below--each with limited resources. Let the sub-groups interact for thirty to sixty minutes, deciding what they can do, and should do. Then, give them the "new developments" and let them interact about what they can do and should do now. Later, in the large group, discuss the alternatives perceived and the ethical decisions made.

### SITUATION 1:

With eleven other adults and three young children you have been shipwrecked on a small tropical island. The island is three miles wide and five miles long, with a couple of mountains, lots of trees, and a good freshwater supply. The soil seems fertile and the lagoon is clear and sparkling. Fortunately, you have been able to salvage the following items before the ship broke up on the reef:

two lifeboats, one damaged beyond repair
three coils of rope (300 feet)
two canteens
one first aid kit
two hand axes and four knives
six blankets
a flare gun and eight flares
a copy of The Torah and three
  old Newsweek magazines
six oars, one splintered
three fish hooks and 100 yards of line
three tins of Sterno (canned heat)
one roll of aluminum foil
some pencils and 100 sheets of paper
fifteen lifejackets (inflatable)
one broken bottle and six empty tin cans

### SITUATION 2:

With a group of ten friends you have obtained a plot of ground in the Western United States and in this isolated region you are setting up a rural commune. The people in the group seem to have various motives but basically they all want to live a "more natural" life, without contact with the urban-industrial society that makes up mainstream America. The group moves into its new setting bringing only limited resources and absolutely no currency or coin! This is a list of the "possessions" which were carried to this natural area:

one hand axe and a whole carpenter's chest full of tools
some nails, screws, and a bale of wire
several large rolls of plastic (12 ft. wide)
box after box of plant seeds
hoes, rakes, a hand plow, and some shovels
twenty blakets and bolts of colored cloth
a large first aid kit
a few pots and pans
each person's clothing
four chests of books
three bags of flour (50 lbs. each)
several tins of salt and pepper
some dried fruit and vegetables
personal items for each person, carried in small bags:
  a Bible, a copy of the I Ching, razors, pocket
    knives, a few photos
  handkerchiefs, headbands, etc.

### SITUATION 3:

Unfortunately, your plane crashes in the cold north woods with you and five other persons on board, Fortunately, no one was injured, but due to winter cloud cover it looks like you will have to survive on your own at least until spring. You have the wreckage from the plane, but the engines and radios will not work. Also, you have the following resources:

a large first aid kit
100 feet of rope
one rifle and 100 rounds of ammo
an axe and two knives
three parachutes (nylon)
a flare gun and twenty flares
two canteens
an inflatable raft with two oars
ten blankets
a broken compass and the ashes of maps burned during the crash

---

Once you have worked out your resource allocation, made some lifestyle decisions, and raised the ethical issues, consider this new development.

### SITUATION 1:

Another shipwreck occurs and 15 new adults come ashore without any resources. They too want to survive. What happens to your island lifestyle? What issues are introduced? How do you respond to this "population explosion"?

### SITUATION 2:

Winter has set in, but now twenty friends from the city arrive at the commune. They have given up city life and want to join the commune. Unfortunately, they don't have any resources to share - except their personal abilities and their sweat. How do you respond to this? How do you justify this response?

### SITUATION 3:

In the depths of winter another plane crashes, burns completely, and you receive four more persons in your group - without any resources to share. How do you respond to the entrance of these new persons?

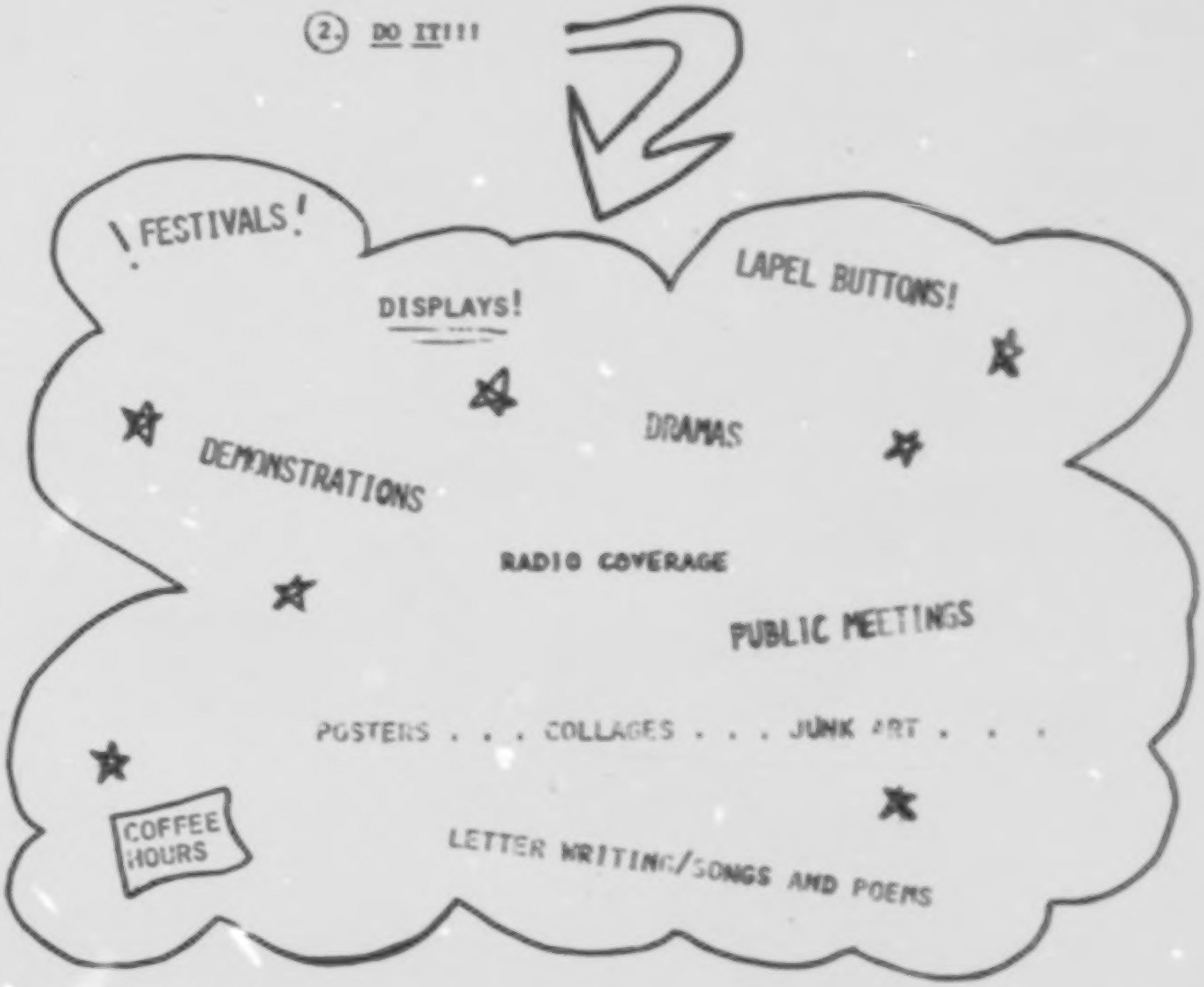
By this time you must feel like the man who worried about his reactions if and when, during nuclear attack, his neighbors were trying to get into his backyard bomb-shelter. When the stakes are high, the decisions are tough! But remember that we too as humans are in a situation where ecologists tell us the stakes are high. We are riders together on a little speck in the vast universe, very dependent upon meager resources - many of them non-renewable.

# campaign

Select an environmental problem facing your area. Now with your classmates, muster all the talent you possess to invent a CREATIVE campaign - then campaign to rally public opinion!!

(1.) List what you can do

(2.) DO IT!!!


! FESTIVALS !
DISPLAYS!
LAPEL BUTTONS!
DRAMAS
DEMONSTRATIONS
RADIO COVERAGE
PUBLIC MEETINGS
POSTERS . . . COLLAGES . . . JUNK ART . . .
COFFEE HOURS
LETTER WRITING/SONGS AND POEMS

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Tallahassee Garden Club, Inc.
Tallahassee, Florida

May 1, 1975

Dear Garden Club Member:

This Ways booklet was produced especially for you. I hope it helps your efforts with those delightful plants that add pleasure and spice to our lives.

The beautiful illustrations in the booklet are the result of Penny Cooke's dedicated and talented efforts. Penny has also published a delightful book "A Child's Garden of Herbs" that is for "the child that lurks in us all." The book is available at our Garden Center.

Persons interested in obtaining fresh herbs for transplanting should visit THE YARB PATCH on Thomasville Road. Phillis Phipps will provide lots of valuable information and herb tea!

In addition to Penny, I'd like to thank Della Gidlon, Margo Simpson and Rosalyn Brantley for their valuable suggestions.

Sincerely,

Mrs. Broward McClellan
President 1973-1975

## Introduction

Euell Gibbons, the crowned king of the natural plant movement finds several uses for herbs. He explains that an herb is to hunt, to learn, to see, to taste, to smell, to cure our illnesses, to eat, to nourish our bodies and perhaps most of all to enjoy. Euell claims that anyone who gets into herbs with diligence and enthusiasm will soon learn that an herb is to love.

Ancient clay tablets record the use of herbs as early as 2500 B.C. The ancient Assyrians knew the virtues of approximately 250 herbs and early Egyptians used elderberry, pomegranate bark, wild lettuce, wormwood, hemlock, and other herbs for health. The Greeks of old used herbs such as mustard, cinnamon, gentian, rhubarb and many others. Ancient physicians and philosophers used herbs to cure the sick.

Herbology as a science has been slow to develop but since the turn of the 20th century it has grown by leaps and bounds. Today herbs are an important part of our lives and life styles.

Herbs and spices. A dictionary defines an herb as a seed plant which does not develop woody persistent tissue, as that of a shrub or a tree, but is more or less soft or succulent. A spice is any of the various vegetable productions which are fragrant or aromatic and pungent to the taste. Thus herbs may be spices as well as herbs. A more useful definition is any plant, tree or shrub that is used as a seasoning, medicine, fragrance or dye plant is an herb.

Almost all the herbs and spices grown in the United States were imported by early American settlers. Herbs played an important role in the hard days of pioneer life. They provided several types of "primitive" medicines including the common table "bitters" that was used as a tonic. Various herbs were also used as astringents, alkalinizers, acidifiers and laxatives.

With today's "modern" medicine we seem to ignore the once popular and often useful "folk" medicine of our forefathers. But maybe it is this same reliance on technological cures that has created our existing environmental problems.

Herbs also provided a little spice in the lives of many pioneer families. Teas, perfumes, scents and cachets made with native herbs provided welcome diversions to annoften ho-hum existence. Plain foods were made into holiday treats with the addition of grandmother's special blends. A north Florida pioneer farm would be likely to have a half dozen kinds of spices cultivated beside it. The most popular ones are discussed elsewhere in this booklet.

These plants often escaped cultivation and became the many "wild" herbs we find growing in roadsides, fields and even deep in the forest.

Today herbs might represent an aspect of the quality of life. In addition to dozens of herbs and spices readily available in many supermarkets, consumers can have herb-flavored toothpaste, vinegars, teas and candies. You can wash with herb-scented soap, set your hair with herb hair conditioner and spray your body with herb deodorant. Herbal air sprays and scented candles can make your house smell like a _ _ _ _.

For something pure, natural and simple we seem to have gotten a little commercial. The rest of this booklet points out some pure, simple and natural uses of herbs beginning with growing a simple garden at home.

## GROWING HERBS

### Location

Locate your herb garden where it will have varying amounts of sun and shade throughout the day. For many herbs, morning sun and afternoon shade is ideal but check on each species' culture requirements before planting. Try to provide as many kinds of conditions as possible and don't be afraid to experiment.

### Soil

Dirt is important! The soil should be well drained and have a pH between 6.5 and 8. Most herbs like neutral to alkaline soils with lots of organic matter like peat, leaf mold or compost.

Spade the garden about a foot deep and work in any organic matter. After a week or so check the pH. If the soil needs "sweetening", add crushed limestone or finely crushed oyster shells. (We don't want to cut the herbs' "feet", so be certain the shells are fine). Let the bed lie barren of plants for another week, then turn again, rake smooth and plant!

### Getting Started

Most beginning gardeners find it easiest to purchase started plants from local nurserys. Many perennial herbs can be started from stem cuttings by rooting them in water or special rooting mediums and then transplanting the started plant to the garden.

Propagation from stem cuttings (get the cuttings from your neighbor!) should be taken in the spring or summer during the active growing season. Look for strong, healthy plants and take new growth. Stems that "snap" when bent - rather than those that bend and do not break - give best results.

Cut below a leaf bud or node using a clean, sharp knife or scissors. Three to six inches of the herb with good foliage is all you'll need. Keep the cuttings in a damp cloth or paper to prevent wilting. Have your containers or flats for rooting ready!

Strip leaves from the lower half of the cutting and dip the stem in rooting hormone. Bury the cutting about 1/3 to 1/2 its length and water to settle the soil. Keep the cuttings moist and provide lots of shade. When the roots have formed, foliage will be a bright green color and the cuttings can be transplanted into individual containers or permanent garden location.

Be gentle when you transplant and leave lots of propagating mix with the root system. Protection from the sun is essential.

If container planted, check daily for soil moisture. Keep moderately moist and sprinkle or mist top foliage to freshen and help combat pests. Rotate containers to encourage even growth. Remember fresh moving air is essential for indoor plants - especially herbs.

## Seeds

Most herbs can be started from seeds but. . . Sow seeds in shallow lines or depressions in the soil and cover lightly with soil. Try mixing smallish seeds with sand for easier sowing! Label and mark the rows so you know what is where.

Firm down the planted rows with a flat board or your hand. Moisten lightly and keep moist (but not soggy). Seeds generally germinate in 12 to 14 days although some perennials may take about a month. Have faith. Thin seedlings when true leaves are well developed. Use scissors and snip off the unhealthy looking plants at ground level. Good Luck!

Fertilizer: Most herbs will get by with a moderate supply of a well balanced fertilizer. Too much will bring luxurious growth but less oil concentration in the leaves. Too little fertilizer will give less foliage and poor flavor.

Diseases and Pests: Generally herb oils tend to repel most insect pests. Check for aphids and red spider mites. Use a weak solution of yellow naptha soap and water spray if needed. Malathion is used on non-culinary herbs for aphid control.

## Plan Ahead

You may prefer to choose one or just a very few herbs to grow in the beginning. The number of each plant you grow will also depend on the amount of time, and garden or container space you have as well as the ways you propose to harvest leaves, flowers and seeds.

Perhaps 4 to 6 plants each of the herbs you choose will be sufficient for a start. Think of having one or two plants of each in containers to bring indoors during the winter.

## Popular Starters

Chives: perennial; hardy to 35°
height - 2 feet
soil - moist - fairly rich
exposure - sun, partial shade
use - culinary
harvest - use fresh or dry or freeze

Garlic: perennial bulb
height - 2-3 feet
soil - rich - well drained
exposure - sun
use - culinary
harvest - dig or pull - dry whole bulbs in dry airy room, then remove tops and roots and store in cool place.

Nasturtium: perennial grown as annual
height - 15 inches
soil - sandy - moist
exposure - sun
use - culinary
harvest - leaves and flowers used fresh in salads.

Oregano: perennial - hardy to 30°
height - 2-2 1/2 feet
soil - average - well drained
exposure - sun
use - culinary
harvest - fresh or dried leaves in cooking.

Parsley: biennial
height - 6-12 inches
soil - moist - moderately rich
exposure - shade - partial sun
use - culinary
harvest - leaves harvested before plant flowers - use fresh or dried

Rosemary: perennial hardy to 0°
height - 2-6 feet
soil - dry and poor - well drained
exposure - sun
use - culinary
harvest - use fresh or dried (in barbecuing burn sprigs in coals just before removing barbecued chicken - smoke imparts rosemary flavor characteristics to meat.)

Sage: perennial - hardy to 30°
height - 2-3 feet
soil - dry-well drained
exposure - sun
use - culinary
harvest - fresh or dried leaves

Yarrow: perennial - hardy to 30°
height - 8 inches to 5 feet
soil - average, dry
exposure - sun - partial shade
use - landscape only and dried heads for winter bouquets Cut first flowers to get second blooming in fall. Use as ground cover planting, accent and border fillers.
harvest the dried flower heads before they mature.

## Harvesting Herbs

Herbs are at their peak just before the flowering cycle and before the morning sun drys them out. This is when herb oils are at their peak in the leaves. Cut the best leaves and stems carefully - don't bruise the leaves! Wash your harvest in cool water to remove dust and soil particles, then inspect the herbs for insects and insect egg cases.

There are several ways of preserving herbs. Some popular ones include:

### Hanging:

Herbs can be dried in small clumps and hung in warm airy places to dry. Cover them with gauze or a paper bag with holes punched in it. Tie them up when they are dry and store (upside-down) in a cool, dry place. Protect them with a covering that will keep bugs and such away but will still allow the air to circulate.

### Oven Dry:

By placing on a cookie sheet lined with a paper towel. A 200° oven and an open door will do nicely! Dry herbs until they are in a crisp "chip" condition and store in clean, labled glass bottles.

**Freezing herbs** is another successful way of storage. Hold a few sprigs with tongs and plunge into boiling water for a minute, then into ice water for two minutes. Drain, seal in plastic bags, label and freeze immediately. Defrost at room temperature and use as soon as possible. NEVER REFREEZE!

**Green herbs** are harvested fresh washed, and put directly into the pot, tea, salad or whatever.

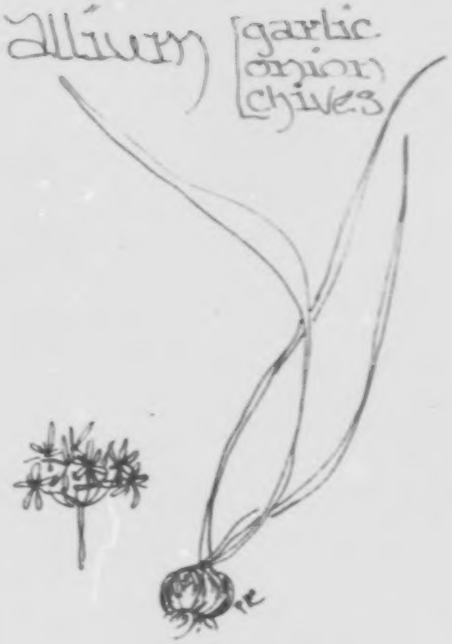
## Herb Lore

Herbs have a long and interesting tradition in cosmetics, perfumes and the healing arts. In ancient times, before modern medication, there was an herb or combination of herbs for any ailment from indigestion to wounds. Some were taken as syrups, infusions or teas. Others were applied as leaves or ointments to the outside of the body.

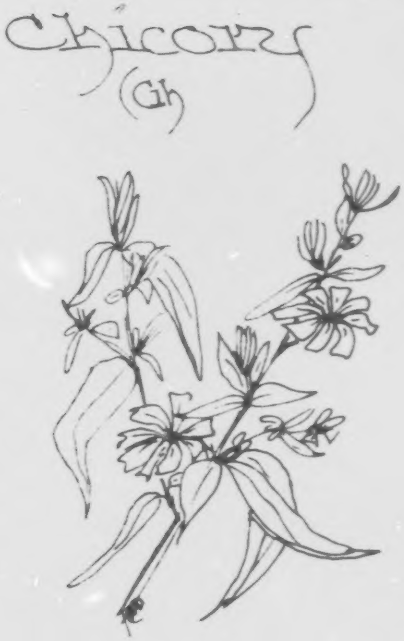
In medieval England sweeping the floors of rooms and hallways of the great castles was a problem and it was customary to spread herbs underfoot to give the places a better smell. "Basil" was one of the most liked "strewing herbs." Rosemary was often thrown on an open fire for the imparted aroma and to ward off disease.

The leaves of herbs - basil, rosemary, marjoram, mint and sage among them - are still used in potpourri and sachets; the essential oils in cosmetics and perfumes.

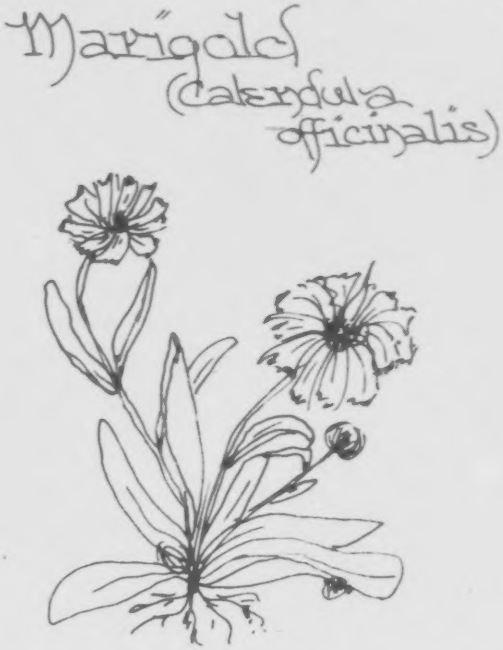
## SOME COMMON AND USEFUL HERBS



ALLIUMS (Garlic, Onions, Chives): All of these plants belong to the lily family. They have medicinal properties, but are best known as "pot herbs." They grow all over the world, but most likely originated in Asia. Plant near roses and get rid of aphids and sucking insects. Cloves of dried garlic ward off witches and the flowers bring one luck.



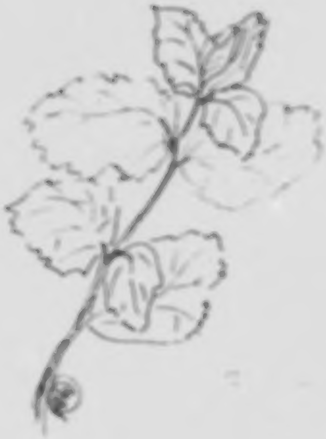
CHICHORY (Chichorium intybus): Chichory is best known as an additive to coffee, but was also used in the treatment of jaundice and ague. Supposedly the origin of chichory is German; a girl waited by the road for her lover to return and at last sank exhausted by the roadside and died of a broken heart... the blue, star-like flowers sprang up from her tears and the plant is known as "watcher of the road."



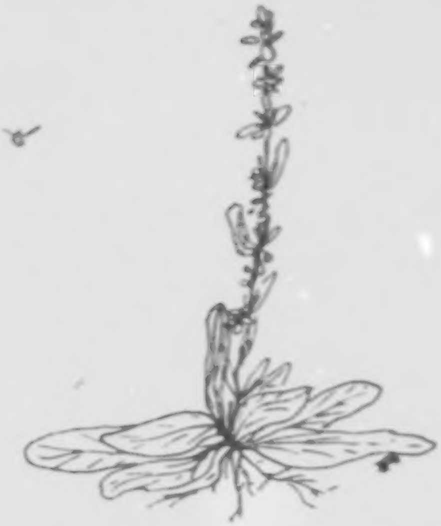
MARIGOLD (Calendula officinalis): These old fashioned herbs are used in every garden. The flowers can be eaten or used as a coloring agent similar to saffron. They also are good as a companion plant.

MINTS (Mentha spp.): Mints comprise the largest of the herb families; all plants which grow with a "square stem" and opposite paired leaves belong to the mint family. True mints (Mentha spp.) will grow almost anywhere. They have been used in medicine, for flavoring and as "fragrant" herbs. Pennyroyal (Mentha pulegium) is used to ward off fleas and ticks. Mint is the symbol of virtue. The Greeks added mint (Mentha spicata) to their bath water.

Mint
(Mentha spp.)

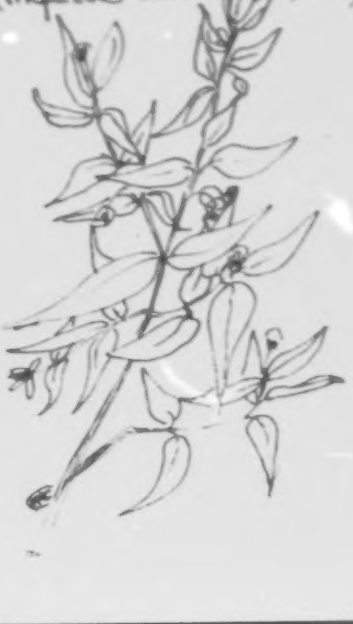


Mullein
(Verbascum thapsus)



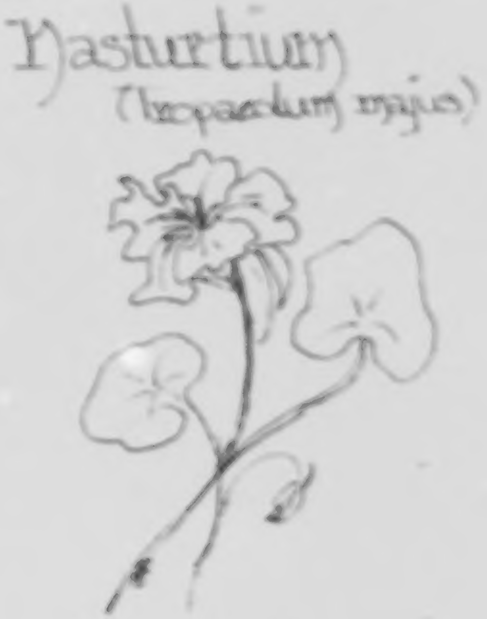
MULLEIN (Verbascum thapsus): This herb has many uses... don't they all? It was used to help relieve pulmonary congestion, but perhaps its most interesting use was by the early settlers who used the tall, stiff spike of flowers as a method of illuminating their homes; the stalks were dipped in suet or wax, then lit; the fibrous leaves were used as wicks for lamps. The French call this herb "herbe de St. Fiacre" (the patron saint of gardeners) and prize it as a culinary herb.

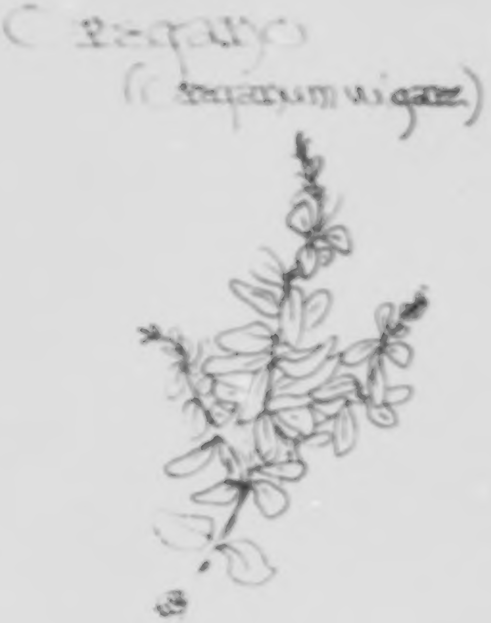
Myrtle
(Myrtus communis)



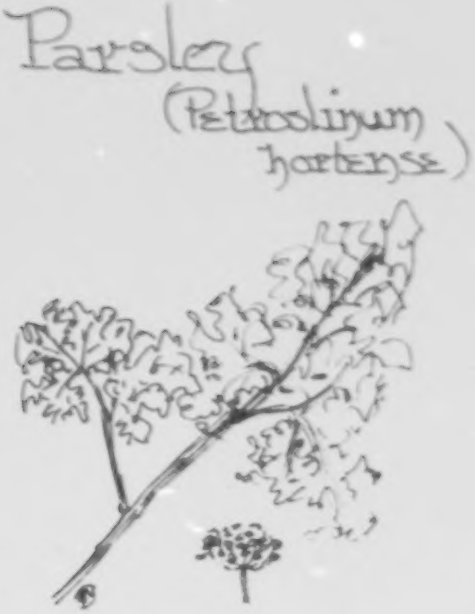
MYRTLE (Myrtus communis: To the Greeks and Romans the Myrtle tree was the symbol of love and immortality. It is a beautiful plant with dark green leaves...very fragrant. The berries are used to scent candles and soap.

NASTURTIUM (Tropaeolum majus): Nasturtiums have long been eaten like cress in salads. The seeds can be pickled and eaten like capers. Both the flowers and the leaves are marvelous in salads.


Nasturtium
(Tropaeolum majus)


Oregano
(Oreganum vulgare)

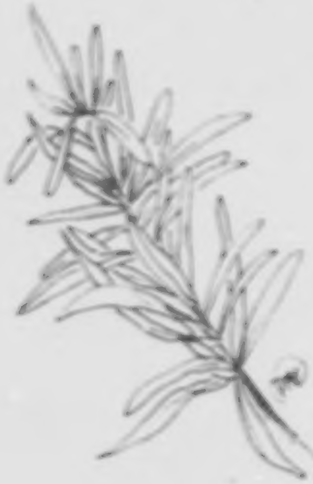
OREGANO (Oreganum vulgare): "The herb of joy." Oregano belongs to the mint family. It is used in medicine, for cooking and as a companion plant with tomatoes and basil.


Parsley
(Petroolinum hortense)

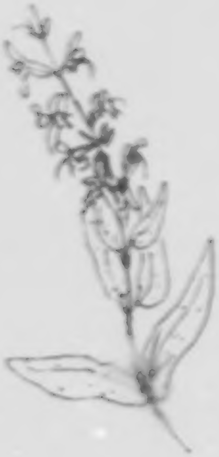
PARSLEY (Petroslinum hortense): Parsley was used by the Greeks and Romans to decorate people and places ...only recently has it been found to be good to eat! It is very rich in vitamins and minerals. Parsley is a biennial plant.

ROSEMARY (Rosmarinus officinalis): One of the most useful of all herbs; it is used for medicine, cooking, as a fragrant herb and as a religious herb.

Rosemary
(Rosmarinus officinalis)



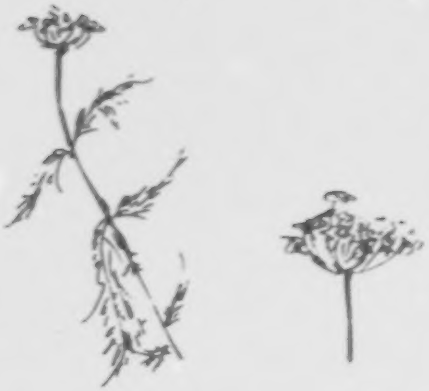
Sage
(Salvia officinalis)



SAGE (Salvia officinalis): Sage is the symbol of wisdom and immortality. It is a medicinal as well as a "pot herb."

---

Yarrow
(achillea millefolium)



YARROW (Achilles millefolium): The medicinal properties of this plant were known to Chiron, the centaur, who taught Achilles how to make a healing salve for the Battle of Troy... hence its name (Achellea millefolium). Yarrow grows, in one form or another, all over the world. It is supposed to be a love charm, stops baldness, when sniffed induces a nosebleed to help relieve a headache...also, if when you sniff yarrow your nose bleeds, it means that the person you love loves you in return. The flowers dry beautifully for flower arrangements.

# ENVIRONMENTAL EXCURSIONS FOR SCHOOL VOLUNTEERS

by Emily Millett
Donna Frinks
Betty Hannum
Jody Fitzgerald
Nancy Moore
Elaine Geiger
Ann Blackwell
Penny Cooke

Timberlane Elementary School
4th and 5th Grade Enrichment Program

HAVE FUN!
REMEMBER THAT
ENTHUSIASM IS CONTAGIOUS

# Mini-Course Guide for Volunteers

Welcome to the exciting world of mini-courses! We feel that the mini-course provides a unique opportunity for students and adults to work together in small groups in areas of mutual interest. Your function in this program may be quite different from other volunteer work since parents and other outside resource persons are frequently called upon to structure units and serve as the adult leaders for the duration of the unit. We have found that the students have much more feeling of continuity if the same adult stays with a unit for the whole time rather than have a different person each time. Guests and field trips can add variety and enrich units. The following suggestions have been prepared to assist you in working as a mini-course volunteer.

--Arrive promptly. Verify the time and location of your visit with the planning coordinator a day or two before to be sure your information is correct.

--If you have been given the responsibility for the group, do not hesitate to take charge. Introduce yourself to the students and have name tags ready for both you and the group in case none are provided.

--Make arrangements for field trips well in advance of the day of the activity. Double check a day or two before to be certain the resource person is still expecting you. Give the students some background information on the place they are to visit before they leave the school. Be sure each student has turned in a permission slip signed by a parent or guardian.

--Be sure to know the name and some background information on special guests so that you may introduce them to the group

--Try to point out the relationship of each session to the others so that the students get some feeling of continuity in the program and can begin to tie things together as they go along.

--If, during the hour, the group seems to be getting restless, take the initiative and call for a stretch break, change the pace of the presentation, or begin to close the session.

--Plan time at the end for students to comment or ask questions. Ask students to help evaluate the sessions as you go along. If there is additional time available at the end of any session, suggest that the students write a thank you note to previous guests or to personnel in the school or on the volunteer staff for making the mini-courses possible.

--Keep notes for evaluation purposes. Note the strong and weak areas of each program so that future units can be made even stronger. List resource persons and their telephone numbers.

--Be sure that each resource person receives a personal thank you from you and/or the children. Letters are greatly appreciated by those who volunteer their time and talent. Co-ordinate this activity with the planning personnel.

## Seeds

Most plants produce seeds which may grow into new plants. New plants require nutrients like nitrogen, phosphorus and potassium. They get nutrients from the soil. In addition, plants require sun, air and water to survive. These requirements may be in short supply to germinating seedlings that compete with larger, established plants. To reduce this competition and increase the chances for survival of new plants, many species have mechanisms that disperse their seeds away from the established parent plants. The dispersal process increases the likelihood that some seeds will arrive at locations favorable for growth.

Seed dispersal is one type of plant adaptation. Name some other adaptations. Adaptations are features of organisms that enable them to survive and reproduce.

The Problem: How do seeds from common plants disperse?

The Action: Go outside and collect as many different kinds of seeds as you can.

More: Arrange the seeds in groups according to how you think they are dispersed (wind, water, mechanical, animals, man). Explain the reasons behind your classification system to your group. Do they agree?

Still More: Using available materials from outdoors or in the classrooms, adapt one of your seeds or invent a new seed that will:

-float on water at least 5 minutes.

-have a mechanism that will throw the seed two feet away from the parent.

-attract a bird or other animal.

-hitchhike on man or other animal.

-fly at least 3 feet.

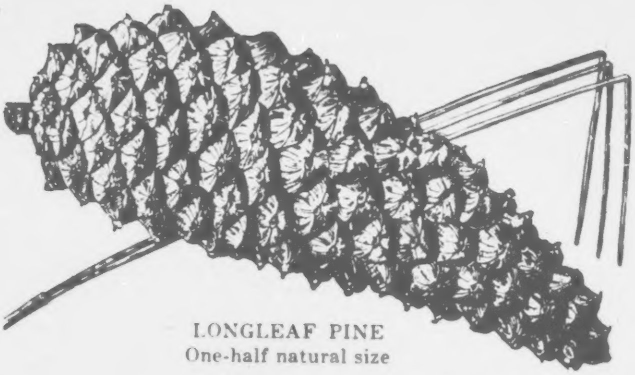
TREE Bingo -

A fun way to learn tree identification is through TREE BINGO. Students can work in teams or individually to seek out the kinds of trees (or plants or whatever) found on the bingo card. The cards shown here contain common North Florida species; this list would have to be modified for South Florida.

Leaders can either take a "show me" trip to point out the individual species or, using the pictures provided here or in "Forest Trees of Florida" (free from the Florida Forest Service, Collins Bldg., Tallahassee, 32304) challenge the students to find the species. Participants must bring back a leaf, nut, flower, or twig that will provide evidence they found the tree.

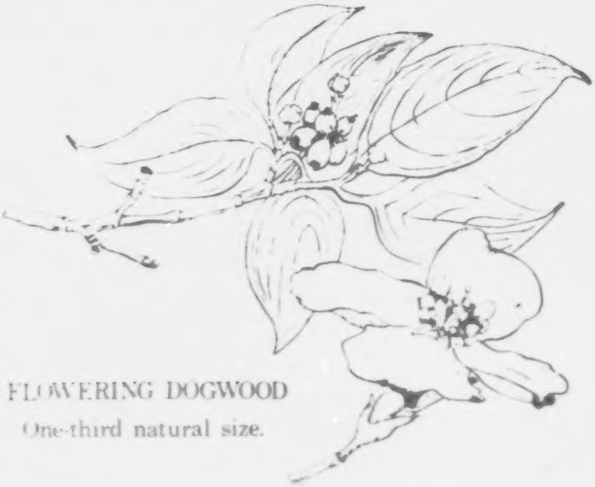
Example: Bingo Card

| | T | R | E | E | S |
|---|---|---|---|---|---|
| B | MAPLE | GUM | SASSAFRAS | DOGWOOD | BEECH |
| I | SASSAFRAS | BEECH | MAPLE | LONGLEAF PINE | DOGWOOD |
| N | BEECH | MAPLE | FREE | MAGNOLIA | LONGLEAF PINE |
| G | GUM | DOGWOOD | MAGNOLIA | SASSAFRAS | MAPLE |
| O | MAGNOLIA | LONGLEAF PINE | BEECH | MAPLE | GUM |



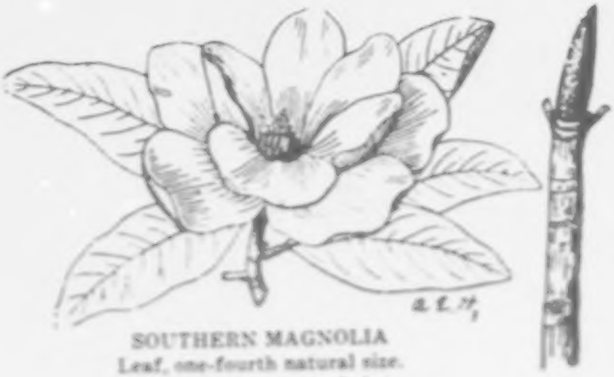
LONGLEAF PINE
One-half natural size

The longleaf pine has cones 6 to 10 inches long and needles 10 to 15 inches long.



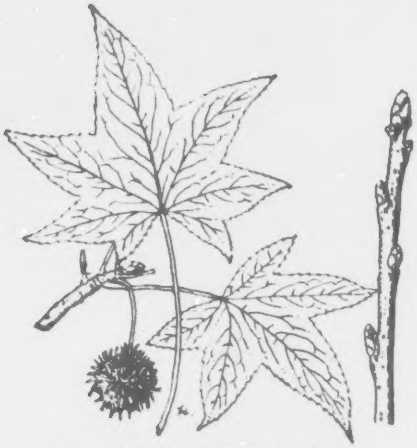
FLOWERING DOGWOOD
One-third natural size.

Dogwood has a white, showy flower in spring, red berries during the fall and large buds during the winter.



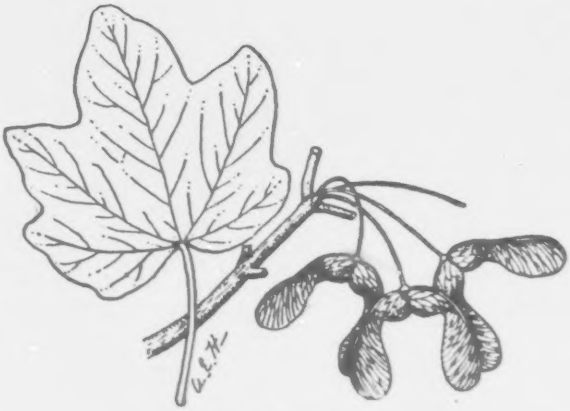
SOUTHERN MAGNOLIA
Leaf, one-fourth natural size.
Twig, one-half natural size.

The beautiful evergreen magnolia retains its huge dark green leaves year round.



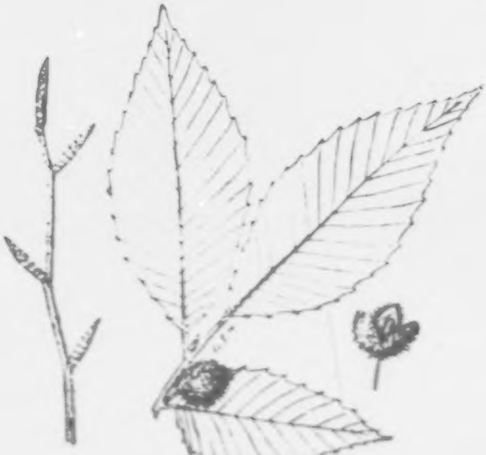
AMERICAN SWEETGUM
Leaf, one-third natural size.
Twig, two-thirds natural size.

The strange seed pod and pointed leaves give away the sweet gum.



FLORIDA MAPLE
Leaf, two-thirds natural size.
Fruit, natural size.

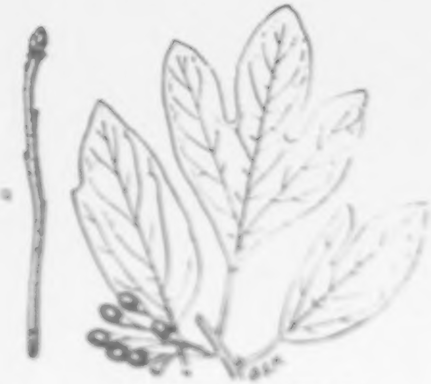
Red branch buds provide a handy characteristic for spotting the Florida Maple.



AMERICAN BEECH
One-half natural size

Watch out for the pointed branches and smooth bark on the American Beech.

Sassafras provides food for wildlife and a delightful tea for people. Look for the strange leaves.



COMMON SASSAFRAS
Twig, one-half natural size. Leaf, one-third natural size.

## OBJECTIVE

Help students follow a piece of trash from the roadside to its final destination. A good technique is a field trip to land fill operations or an incinerator. If a trip is not possible, identify and locate the sites on a city map and ask a resource person to explain their operation.

## ACTION

Data on population increases in your community can be correlated with increases in land fill or incinerators to drive home the lesson of the need for recycling.

## OBJECTIVE

## ECONOMICS OF LITTER-THE COSTS OF LITTER

## ACTION

Have students count the number of litter items on the schoolyard. If the area is too large or the quantity of litter too great you may assign your class to count only a certain area of the schoolyard.

After the students have made a simple count of litter items have them multiply the quantity times thirty-one cents (thirty-one cents is a good approximation of the cost to the public to pick up one piece of litter and dispose of it).

For example if the class finds 300 pieces of litter the cost to the community would be 300 x $ .31 = $93.00.

Then lead the students into a discussion about what they would do with $93.00 if they had it. Students will suggest hundreds of ways to spend money which they prefer over picking up litter.

This lesson in economics will help develop anti-littering attitudes in your students.

## OBJECTIVE

### UNDERSTANDING THE ENVIRONMENTAL COSTS OF PRODUCING PAPER

## ACTION

Have the students collect the newspapers used in their home for a week. Weigh this and multiply it by 365 to determine approximate weight of newspaper each family would use in one year. Determine the total weight per year in tons for the entire class.

### PROBLEM

If it takes seventeen trees to make one ton of newsprint, how many trees are used up for newspapers by the families represented in your class? Follow this problem by discussion of some possible harmful effects of removing trees, the possibility of using recycled paper to save trees, *conserving* paper in school to save trees, and other related subjects.

## OBJECTIVE

### GLITTER AREAS AT YOUR SCHOOL

## ACTION

Designate some areas of your schoolyard as the "Glitter Area" for your class. It then becomes a simple task for your class to keep their area "glitter clean." Emphasize the clean appearance of your class areas as compared to other sections of the campus. If possible, encourage other teachers to choose glitter areas and set up healthy competition. Well kept areas could be rewarded by preparing a glitter award signed by the Glitter chairman of your local garden club. A good program would lead to an entire campus award which could be displayed in the principal's office.

# OBJECTIVE

UNDERSTANDING THE INTERDEPENDENCY OF ELEMENTS IN THE ENVIRONMENT

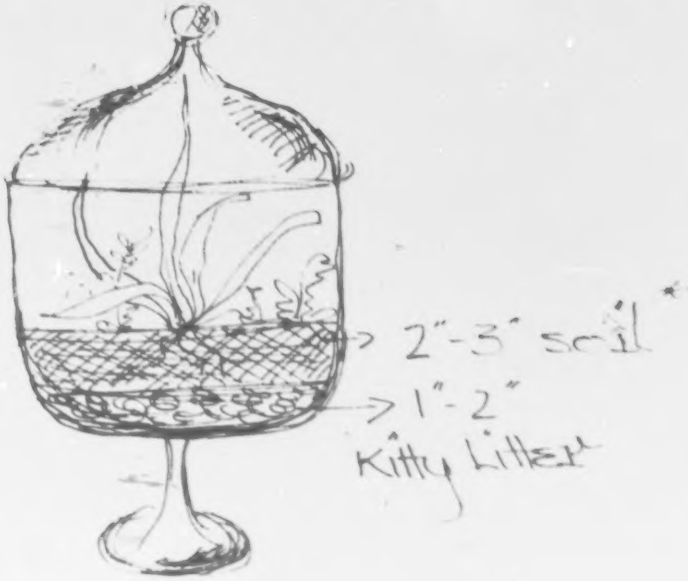
Questions to solve:

What does the parking lot at the Tallahassee Mall have to do with the number of fish you catch on Saturday morning at Lake Jackson? How can the place your neighbor decides to plant his garden affect the number of puddles in your yard when it rains?

# ACTION

Invite an environmental engineer to the class to talk and show slides about the problem of erosion and drainage that can be caused by the development of land and what kinds of measures can be taken to prevent destruction when land is cleared.

And then look for examples of erosion on the school grounds and in your own neighborhood. Suggest ways these problems can be solved. Write a letter to the appropriate person with your suggestions for preserving or improving the land.



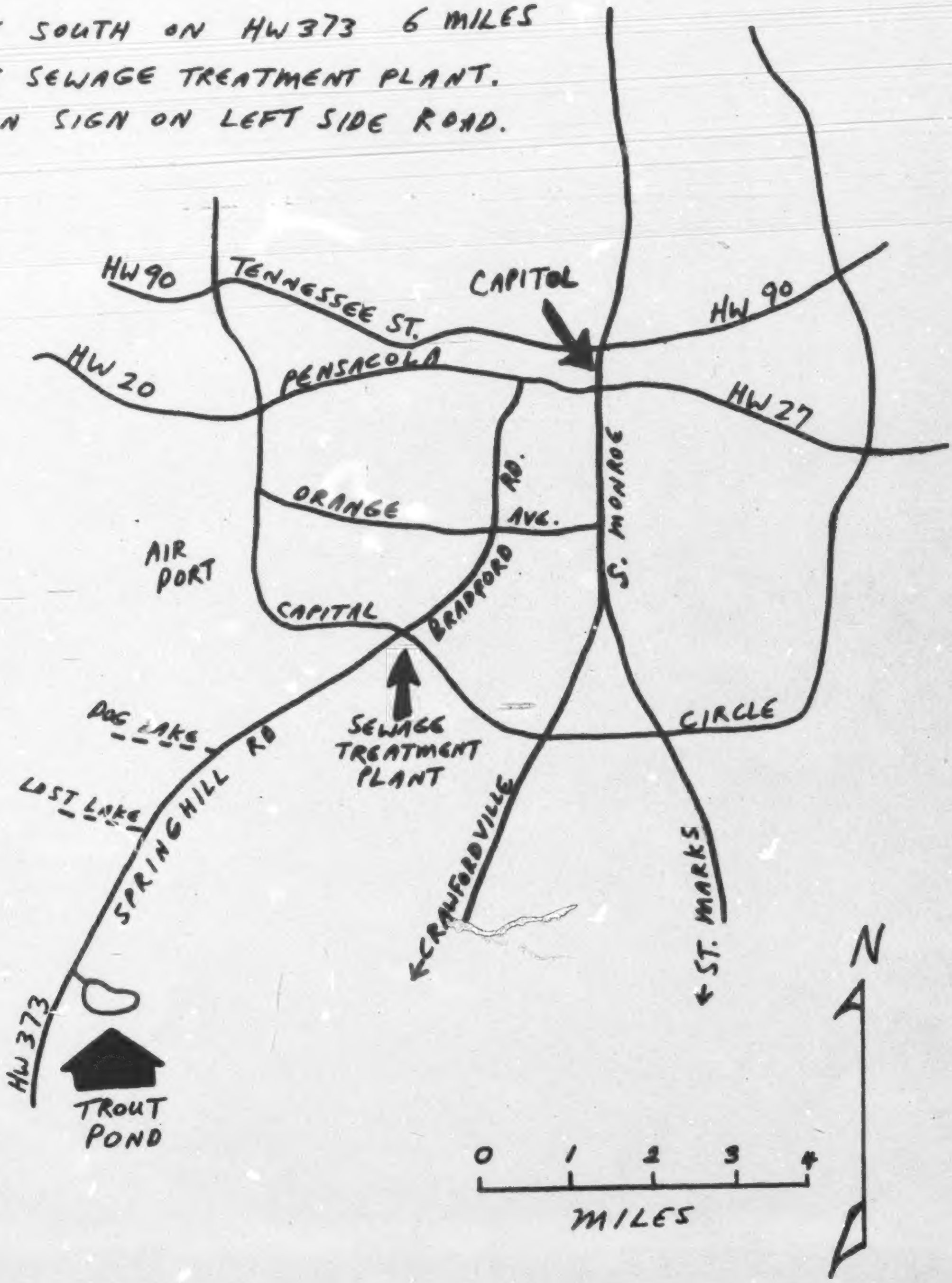
* use a simple combination of "Jiffy-Mix" and "African Violet" soil.

Terrariums can provide simple and inexpensive learning tools for children. Gallon jars provide students with the container. Observation, record keeping, and prediction skills can be readily developed using available materials and native plants.

Let students experiment with their terrarium and remember to ask questions! What would happen if. . . . ? The students' enthusiasm and energy will do the rest.

## LOCATION OF TROUT POND

DRIVE SOUTH ON HW 373 6 MILES
PAST SEWAGE TREATMENT PLANT.
BROWN SIGN ON LEFT SIDE ROAD.


HW 90
TENNESSEE ST.
CAPITOL
HW 90
HW 20
PENSACOLA
HW 27
ORANGE AVE.
RD.
ST. MONROE
AIR PORT
CAPITAL
BRADFORD
SEWAGE TREATMENT PLANT
CIRCLE
DOG LAKE
SPRINGHILL RD
LOST LAKE
CRAWFORDVILLE
ST. MARKS
ST. MARKS
HW 373
TROUT POND
N
0
1
2
3
4
MILES

Trout Pond Recreation Area is located approximately 12 miles south of Tallahassee, Florida, in the Apalachicola National Forest. This recreation area was designed and built for handicapped persons and their families. Present facilities consist of 15 individual picnic tables, a picnic shelter with four tables, a swimming pool with spray pool and sunscreen, an eight-unit flush toilet building with dressing rooms, a fishing pier, 24 benches, waterfront areas, 3,500 feet of paved trail, and a first aid-craft building.

The Trout Pond Recreation Area is located on a dry-sand ridge surrounding a ten-acre lake. Vegetation within the area is primarily longleaf pine and turkey oak with wire grass understory. The lake is surrounded by a thick ring of cypress and titi. The land is typical of much of the land throughout the Panhandle Region of Florida. The soils are composed of deep sand with sand topsoil overlying limestone bedrock. Slopes range from nearly level to 13 percent.

These facilities have been designed to accommodate handicapped individuals and groups, and also educational groups from the school systems, primarily grades four through six. The interpretive area consists of a 700-foot long paved trail and four paved interpretive areas. At each of these areas is a push button and loud speaker. These are connected to an automatic recycling visitor-operated tape recorder to present the message. There are also exhibits, wood samples, and items for students to manipulate. Also, along the trail is a 140-foot long boardwalk that permits the students to see the vegetative type composed of titi and cypress along the pond margin.

The environmental education facilities are available to groups on a Reservation Basis Only. Contact the District Ranger by dialing 904 (AC)-222-9549, Crawfordville. He will set up a time for your group and mail you the lesson plans so each group will have a copy.

Helpful Hints

1. Explain the purpose of the field trip before you arrive.

2. Tightly structure the group when you first arrive to acquaint the participants with the area.

3. Then allow time for each person to pursue their own interests.

4. One adult for 8 children is a good ratio for maximum learning.

5. Elmers Glue, bags and field guides are handy to have.

6. For arrangements, call the U.S. Forest Service's district ranger at 222-9549.

# DEVELOPING READING COMPETENCY IN ENVIRONMENTAL EDUCATION: SOME SUGGESTIONS

Prepared by

Kit Bieschke
Yolanda Hanna
Ricky Keith
Craig Nelson
Tallahassee Adult Literacy Council
Robert West
Gadsden County Schools

With a little help
from the Project staff

April, 1975

The ultimate goal of any reading program is to motivate the participants in such a way that they will develop an interest in reading and eagerly turn voluntarily to books for pleasure and knowledge. Perhaps, if we make reading activities and skill practice exercises more interesting and relevant to the participants, we may come closer to this goal. The following reading activities and exercises have been created around the theme of environmental education because ecology is a topic of wide and important general interest. We hope that these activities will capture the interest of the participants in reading programs.

1. Directions: There are times when you read or hear a word whose meaning you think you know. But when you try to define it, you can't. This exercise gives you an opportunity to see how many of the following words from environmental education materials you can define in your own words. First write out your answer to the words you think you know; then use a dictionary to look up all the words, comparing your answers with the dictionary definition. The students may make vocabulary cards for some of the words.

| Word | Your Definition | Dictionary Definition |
|---|---|---|
| 1. conservation | | |
| 2. ecosystem | | |
| 3. pesticide | | |
| 4. endangered species | | |
| 5. biodegradable | | |
| 6. ecology | | |
| 7. pollute | | |
| 8. recycled | | |
| 9. environment | | |
| 10. contamination | | |
| 11. extinction | | |
| 12. erosion | | |
| 13. reforestation | | |
| 14. geology | | |
| 15. wildlife | | |

2. Have the students construct an environmental dictionary or personal glossary of terms they have learned.

3. Sentence building combines practice in reading with an exercise to develop an awareness of English syntax. On the board or on a transparency the teacher prints words in lists under numbered headings.
Directions: One student is called upon to choose a word from column 1 and read it aloud; another student chooses a word from column 2 and reads it. The same procedure is followed for each column thus 5 people will put together a sentence. (The teacher can provide for individual student success by assigning students to identify words they know; even the slowest learners can identify one of the words.) Many combinations are possible. A student may also add a word of his own if it fits the particular class.

| Determiners | Adjectives | Nouns | Verbs | Adverbs/Prep. Phrases |
|---|---|---|---|---|
| the | polluted | hunter | sits | into the woods |
| a | happy | river | is | by the tree |
| an | excited | fisherman | flew | across the sky |
| one | big | bird | ran | deadly |
| every | scared | ecologist | walked | of the trash |
| that | smiling | girl | disposes | along the path |
| each | snarling | bear | jumped | beside the creek |

4. The students will practice using colorful adjectives and other descriptive words of particular kinds. In this exercise they will think of words to describe sense impressions: 1) sight, 2) smell, 3) sound, 4) touch, 5) taste.
   Directions: Take a walk in the woods or to some particular area outside on the school grounds. Instruct the students to carry a paper and pencil and write down descriptive words for the sense impressions they experience. They may sit down under a tree, walk around, etc.

5. Another activity that combines awareness of sound with words uses the seasons.
   Directions: Have the students list words that are associated with sounds they hear in each season. Teacher may explain the form of the Japanese haiku poetry. The syllables are counted on each line in a three-lined unrhymed sequence on a theme. 1st line-5 syllables/2nd line-7syllables/3rd line-5 syllables. For example: Summer words might be -crashing waves, warm sunshine, tan bodies, volleyball games.

   This haiku might be formed: *Crashing waves were heard*
   *and volleyball games were played*
   *Summer's here again.*

6. Using Structural Patterns- The teaching of prefixes and suffixes and analyzing words will help the student in pronouncing words and finding the meaning of words.
   Directions: Below is a list of prefixes and suffixes (with the meanings) along with an example word which follows the ecology theme. There are two games which can be played using the structural patterns and the root. One game is played like "anagrams." The roots are written on strips of paper and mixed together in a pile on a table. The prefixes and suffixes are written on strips of paper and mixed together in a second pile. The student picks one strip from each pile and attempts to make a word. The strips are left face up on the table for other students to play on. The student with the most words is the winner.

   Another game is played like concentration. The roots and structural patterns are written on index cards which are placed face down on a hard surface. Two to four students play, each taking a turn exposing two cards at a time. The object is to match as many cards as possible. The students take turns until there are no cards left. The student with the most cards wins.

   List of structural patterns and examples

   ble- capable of - biodegradable
   er- person/thing having to do with - polluter, hunter
   ful- abounding in, full of - wasteful
   ment- concrete state of - environment
   ous- possessing qualities of - poisonous
   tion/sion- action, state, result - pollution, conservation
   anti- against - anti-pollution
   ness- state, condition, degree - wastefulness
   ly, y, ty- having characteristic of - smoggy
   re- back - recycled
   ed - recycled, protected
   ing - camping, hunting
   logy - study of - ecology
   geo - earth - geology
   bio - life - biology
   zoo - animal - zoology

7. Creative Reading (making inferences and judgments)
Directions: Write out the completion in at least two or more sentences. It is alright to differ in judgment and inference.

a) *Once there was a great field. At one edge of the field there were trees and bushes and on the other a thin country road that curved about untraveled for many miles.*
*In the middle of the field there was a tree, a single tree that had been growing for more than a hundred years. It was gnarled and its branches spread in many directions. The children from the neighboring villages would* ______________________________

______________________________________________

b) *This young man can be seen at any football game. He has a box of popcorn, a package full of wrapped candy, and a coke. He takes a piece of candy out of the wrapper, pops the candy in his mouth and throws the wrapper down to the ground. He finishes his coke and proceeds to "drop" the cup down through the bleachers. This man is* ______________________________________________

______________________________________________

c) *A group of boys were out for an afternoon of fun in the woods. The bet was to see who was the best shot. After two hours the scores showed Johnny in the lead with a total of two doves and a cardinal, dead in the brush. Tommy was second, having shot two crows. Tommy's younger brother, watching this competition, thought* ______________________________________________

8. "Meggit" is a nonsense word, a noun, that is used in a game to heighten students listening ability, to practice their use of parts of speech and to expand their word knowledge.
Directions: Have the students write a story, substituting the word "meggit" for the subject whenever it arises. The words should have something to do with the environment. Ask the students to read each aloud and have the group guess what the meggit may be. The "twenty questions" format may be used.

9. Literal Comprehension and Interpretation - After students read a selection, such as this newspaper article, it is important to stimulate discussion with interpretation questions. Since interpretation often depends upon connotative use of language the teacher should focus student's attention upon particular words or phrases that convey strong emotional coloring.
Directions: The article should be presented to students without the headline. As the students read the article they should circle the words that have strong emotional appeal.

1. Place the circled words with favorable and unfavorable connotation in the appropriate columns.

| Favorable | Unfavorable |
|---|---|

2. Make a list of those statements which support cock fighting and those which are against cock fights. OR Have the students write a paragraph either for or against cock fights using the information from the article.

3. Instruct the students to write an appropriate headline for this article.

4. What does the writer mean by "cock fighting interests were caught with their feathers down...?

5. Is Senator Scarborough for or against cock fighting? How do you know?

6. Why was the animal protection bill delayed? Describe what happened.

7. Either orally or in written form have the students explain their personal feelings and conclusions concerning the cock fighting issue, and why or how they arrived at them.

Part of an article about cock fighting from the Tallahassee Democrat (April 18, 1975) was removed to conform with copyright laws.

10. Read and Pantomime is a game which is most successful with younger children. This game can be played in the classroom or outdoors.
Directions: Teacher will prepare strips of paper with instructions on them for a student to act out an activity. Each strip could be prepared taking into account the reading ability of each pupil. Classmates are to guess what the student is doing. (Activities should take place outdoors).

Examples:
- climb a tree
- pick flowers and put them in a basket
- pick up trash
- be a bulldozer and knock down some trees
- be a bird and pull up a worm from the ground

11. Charades (Environmental Style). This game is successful with students of all ages. The students are divided into two groups.
Directions: Each group composes a list of plants and animals which the other group must use. One member of the group is given the word and he or she must act out the word in some manner so her teammates can guess the word. (rules are like "charades). With younger children the teacher may have to supply some words, but the older students usually come up with difficult words. The words may be used to start a vocabulary list.

12. A treasure hunt. Provide a variety of sensory experiences for the students to describe. Items found could involve taste: bitter chocolate, cheese, sunflower seeds, spices, lemon, orange peel, apple and salt. Items with a distinctive smell: wet paper toweling, wet wool cloth, leather, apples, onion, spices, and vinegar.

13. Seeing relationships of ideas in words. Logical thinking is often based on the ability to understand the relationship of ideas represented by words. Students could make up their own statements or fill in the blank with the related word.

-Drinking water is to people as rain is to a tree.
-A free barbecue is to people as a picnic is to ants.
-A house is to people as a cave is to a bear.
-Female is to male and a cow is to a bull.
-Water is to fish as air is to man.
-Sand is to beach as water is to ocean.

14. Connotative meanings. Some words have a "circle of ideas and feelings surrounding that word and emotions that the word evokes." (Dale). Synonyms for the word, environment, carry different connotations: surroundings, scenery, terrain, suburbs, neighborhood, background, and boundary.
How many growing things have you used connotatively?

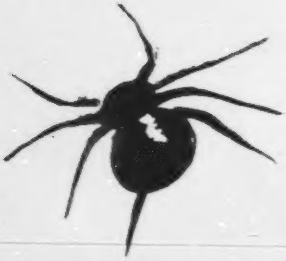
peach
peachy
apple
plum
egg
banana
lemon
hot potato
violet
pansy
vegetable
fruit
nut
pea

How about animals?

cat
kitten
rat
mouse
peacock
duck
goose
moose
deer
lamb
sheep
monkey
whale
beaver
worm
tiger
fox
bear
wolf

15. Some television shows use syllabic writing (rebus) to illustrate words. Many English words are made up of two simple words. Some of these words we see in the environment. How many more can you think of?

sidewalk
cattail
hillside
cottonwood
dogwood
chinaberry
blackbird
seashore
roadside
sunflower
grapevine



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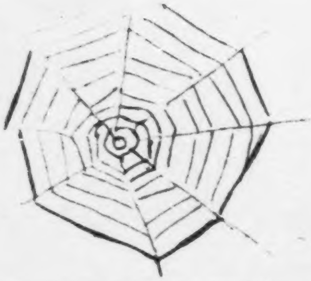

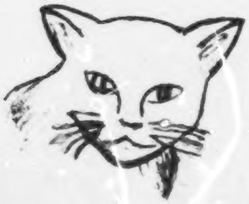

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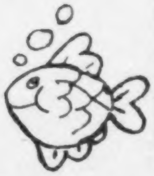

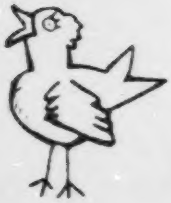

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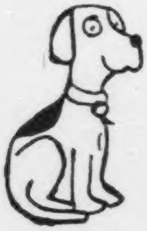

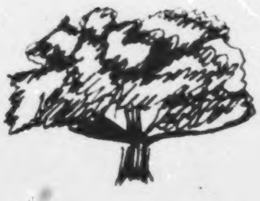

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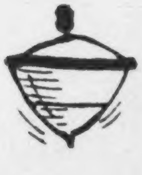

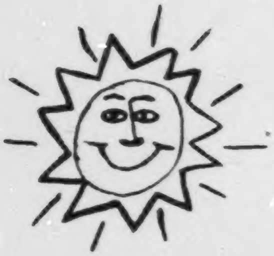

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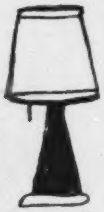

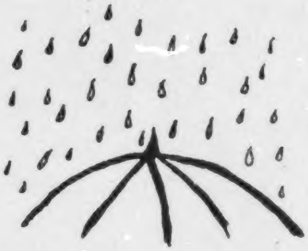

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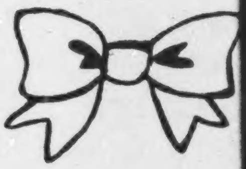

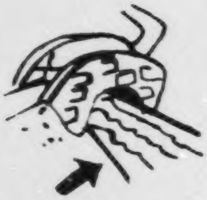

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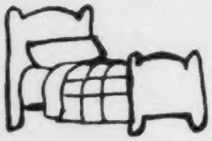


16. Have the students underline the cause of the problem and draw two lines under the effects of the problem. Assume you are a private citizen suffering from industrial pollution. What would be your demands of industry? Assume you are an industrialist accused of allowing your industry to pollute air or water. What information do you infer from the article? After talking about the article to someone write a short statement about what is said.

Articles from New York Times and Tallahassee Democrat have been removed to conform with copyright laws.

17. Suffixology - Logy means "the study of." Some common root words used in environmental education are listed below. A list of words ending in "logy" could be given to the students. Those they know could be checked; those unknown could be discussed or looked up in the dictionary.

zoo - animal
astro - star, planet
anthrop - man
archaeo - ancient, primitive
meteoro - high atmosphere
ornitho - bird
bio - life
geo - earth

18. Describe your feelings about your environment by learning three new words. Now describe or use three new words that someone who doesn't like your environment would use. What three words would someone who liked your environment be likely to use. Share your new words with two friends.

familiar
alive
active
smoggy
crowded
impersonal
friendly
modern
exciting

19. It is a warm sunny Sunday in the park. Talk about what is going on. Have one person in your group record what is said. Pretend that two hours later a sudden storm has gathered. What happens next? Afterwards copies of the conversation can be read.

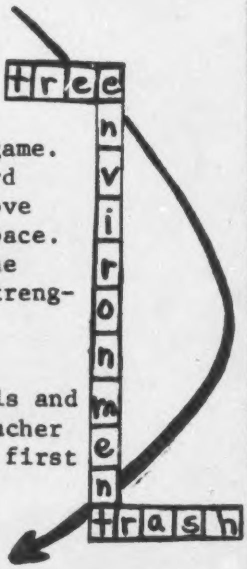
20. Language Experience Exercise. Take the participants on a nature walk and ask them to observe all of their surroundings. Once back inside ask the participants to make up a story about what they saw. Have them dictate the story into a tape recorder. The teacher then transcribes the story onto chart paper. The participants are then able to read along with the tape and be exposed to many new words in their sight vocabulary, which are in their speaking vocabulary.

21. Sequencing. This is an activity for participants who have trouble with ordering things in sequence. Make up sentences that make sense to the participants. Next cut the sentence strips in phrases. Each sentence should be in three or four parts. Scramble the sentence strips up and ask the participants to rearrange them to make sentences in a logical sequence.

EX. John saw/ the car/ speed by him.
Someone/ in the car/ threw out/ a beer can.
He walked/ over and picked/ it up.
He threw it/ into the closest/ garbage can.

22. Checkers. This game is played much the same as the conventional game. The changes in the format include 1) all the red spaces have a word dealing with the environment printed on them and 2) in order to move onto a red space you must be able to pronounce the word in that space. This game can be used for many purposes simply by interchanging the words in the red spaces. For my use the words used would be to strengthen sight vocabulary.

23. Make it Grow. This activity is used to develop word building skills and can also be used to strengthen comprehension of materials. The teacher makes up a series of riddles. The answer to each riddle after the first one begins with the last letter of the previous answer.



EX. 1) I am what paper comes from.
2) I am a big word that describes everything around you.
3) I am what makes up litter.

24. Drawing Conclusions. The teacher makes up or takes a selection from a book and presents it to the participants. The participants are asked to read the selection very carefully. The participants are then asked to write an ending from the material in front of them. A good example of this, while using a different media, it to let the participants view the film "Treehouse" and write their own ending to the story.

25. Finding the Main Idea. Pollution is one of the biggest problems facing the people of the world today. This problem is one that has creeped into the lives of everyone. We are all affected by pollution of the air we breathe and the water we drink, etc.

Ask the participants to read a short passage and to make up a title for the story. Ask them to write down a title, why they chose that title, and a list of some things that caused them to make that particular choice.

26. Decoding Through the Use of Context Clues. The participants are given a short selection containing a word that is new to their vocabulary, for example, "pollution." The selection is written so that through the use of context clues they will be able to figure out the meaning of the word by reading the entire passage. Example: Pollution is a very serious problem. Pollution can be found almost everywhere we look. We can see pollution all along our highways--just look at the bottles. We can see pollution by testing our water for all the harmful things it contains. In the bigger cities there is so much noise that it hurts people's ears; this is called noise pollution. Pollution could best be described as ______________________________.

27. Locational Skills Exercise. The purpose of this activity is to acquaint participants with various creatures of our environment. While getting acquainted with the creatures, the participants will develop locational skills such as map skills, dictionary skills, skills for using an encyclopedia, the use of an index table of contents to find the answers to the questions below.

The Porcupine and the Raccoon

| | Porcupine | Raccoon | etc. |
|---|---|---|---|
| Appearance | | | |
| Home | | | |
| Food | | | |
| Means of protection | | | |
| Habits | | | |
| Young | | | |
| Size | | | |
| Where found | | | |
| Usefulness to nature | | | |
| Hibernation | | | |

28. Ecology Crossword Puzzle.
Purpose: To provide practice in identifying words through context and initial letter.
Procedure:
1. Make ditto of puzzle.
2. Make up key.
3. Write these directions on poster board, take a blank puzzle and fill in as many words as you can.

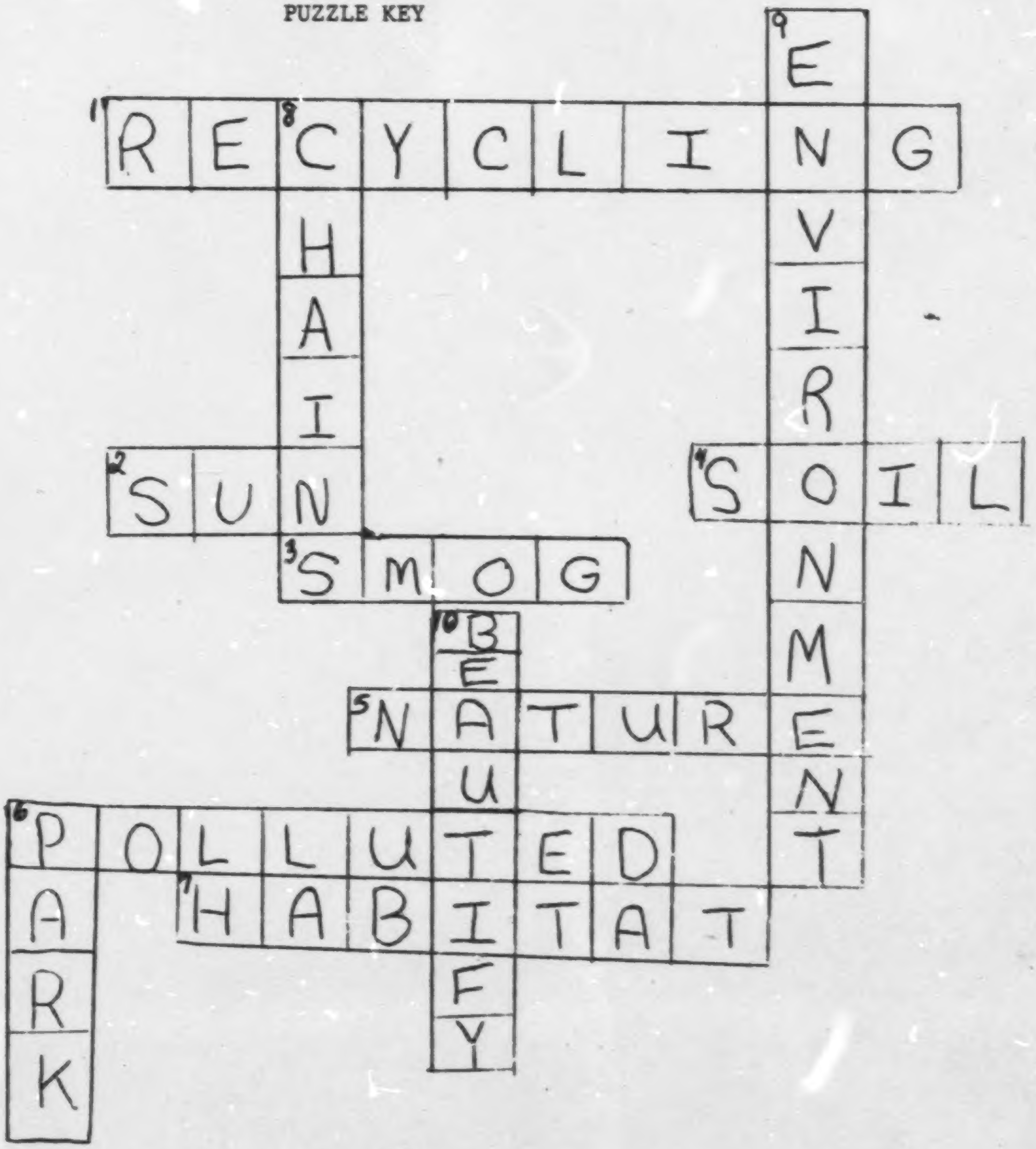
## Across

1. Using natural materials over again:_______________.
2. Energy that is the source of all life:_______________.
3. Polluted air:_____________.
4. Plants need this to grow:________________.
5. What we need to protect:_________________.
6. Dirty air or water:____________________.
7. Where animals live:____________________.

## Down

6. Place where environment is preserved: National _________.
8. Food follows pathways called food:___________.
9. The natural world around us:___________.
10. To make our environment look better:______________.

### PUZZLE KEY


1 RECYCLING
2 SUN
3 SMOG
4 SOIL
5 NATURE
6 POLLUTED
7 HABITAT
6 PARK
8 CHAIN
9 ENVIRONMENT
10 BEAUTIFY

29. Language Experience Method. Basic Idea: In the language experience approach to beginning reading, the participants read stories about their own experiences that the teacher has written down on paper. How is this done? 1. Plan a field trip to the Junior Museum, city zoo, state park, . . . ., etc. 2. Have the participants engage in a discussion about the experience. 3. The teacher prints the stories on paper. 4. Under the guidance of the teacher the stories are committed to memory. 5. The participants learn to associate the spoken sentences with printed sentences, then the spoken phrases with printed phrases, and finally the spoken words with the printed words. This approach can teach word identification skills in many ways and can be used as a lead-in basal approach, as a teacher-developed method, or with one of the commercial forms available.

Activities for Reinforcing Associations:

1. Illustrate on the story, words and phrases that can be pictured. These pictures are then labeled correctly and serve as word-pronunciation keys.
2. Develop picture dictionaries that contain words and pictures used in the stories. These picture dictionaries can be arranged by a) story or b) alphabet.
3. The Language Master device can be used to reinforce associations. The word is printed on a blank card, the spoken word is recorded on the tape. The participants look at the word as the tape plays back the spoken word. After a while, the participants try to say the word before running it through the machine. Use it also for phrase practice.

30. Clean the Beach.
Purpose: To provide practice in recognition of blends.
Materials: Cardboard, bucket, and felt pens.
Procedure:
1. Construct or draw a picture of a beach on cardboard.
2. Cut remaining cardboard into the shape of tin cans.
3. Write various blends on one side of the paper cans.
4. Place all cards with the blends face down on the beach.
5. Upon picking up a card, the participants must give a word beginning with the blend on the card.
6. If correct word is given, participants place card into a bucket. If participants cannot give a correct word then he/she must return the card to the beach.
7. Object is to pick up all the cards so the beach will be litter free.

31. Take a Walk With the Alphabet.
Purpose: To identify objects by initial letter symbol.
Materials: Ditto
Procedure:
1. Each participant gets a ditto that has the entire alphabet on it.
2. Class will take field trip to Junior Museum, park, or walk around their school grounds.
3. Participant will identify objects that they see and place them with their initial letter.

EX. Things one might see at the Junior Museum.

a : ant
b : bee
c : car
d : dog
e : egg
f : frog
g : grass
h : horse
i : infant
j : jar
k : kettle
l : log
m : moss
n : nest
o : office
p : policeman
q : quilt
r : rainbarrel
s : sun
t : telephone
u : underbrush
v : vise
w : window
x : xylem
y : yoke
z : zinnia

32. Fish for Words.

Purpose: To provide practice in blends, initial vowels, or initial consonants.

Materials: Cardboard, paper clips, wooden stick, string, magnet, felt pen.

Procedure:
1. This activity is a good one to use before going to lunch or before recess. Construct or draw a picture of a lake. Make cardboard fishes and place paper clips through one end. Tie string to a wooden stick or pencil and attach magnet to other end.
2. Place twenty fish cards face down in lake. Call on one participant to come catch a fish with the magnet.
3. Upon catching a fish, the participant must give a word beginning with the blend, initial vowel, or initial consonant.
4. If correct word is given, the participant places fish out of lake. If incorrect, the participant places card back into lake.
5. You keep fishing until word is missed and then it is another participant's turn.
6. Teacher should call exercise to a close before all the fish are caught stressing that it is not ecological to take all of the fish out of the lake because there will be no more to catch tomorrow.

33. Story Pantomime.

Purpose: To provide practice in reading for information and following directions.

Materials: Cards on which are printed directions for acting out a certain activity.

Procedure: The cards are passed out to all the participants in the class. One participant is selected to act out each set. The other participants watch critically for the complete acting of every detail in the directions.

Example: Pretend you are planting a garden. Choose the right place for your garden, stake out your plot, spade the soil, plant your seeds, hoe the weeds, water your plants.

34. Scrambled Sentences.

Purpose: To provide practice on syntax structure.

Materials: Cardboard, felt pens, egg carton, and plastic eggs.

Procedure:
1. Write sentences on cardboard and cut paper into strips of one word each, and place one per plastic egg.
2. Participant takes egg from carton.
3. Egg is broken and scrambled sentence is taken out.
4. Participant arranges sentence into proper order.
5. Participant can self-check work from answer list on inside of carton.

Examples:
1. Plants drink their food through their roots.
2. What is all the paper doing floating in the water?
3. Our National Parks are for people to enjoy.
4. A seal can only live in cool ocean waters.
5. Cigars and cigarettes dirty our air with smoke.
6. Do you have a garden in your backyard?
7. We could not see the beach for all the litter.
8. I like the fresh air of our city.
9. The earth is heated by the sun.
10. Flowers bloom in the spring.
11. We are going to visit the Grand Canyon.
12. You can no longer swim in our river.

35. Park Adventure.

Purpose: To provide practice with sight words.

Materials: Cardboard, felt pens, deck of 100 sight cards, participant markers.

Procedure:
1. Construct or draw a map of the United States Parks System on cardboard. Model is given on page 15.
2. Number the Parks with Everglades being number 1 and Olympic National Park being number 34. Deck of sight cards is placed to the side of board.
3. Participants move around board in numerical order visiting each park. Upon arriving at each park the participant must pick the top card from the deck. If participant correctly identifies sight word then he moves on to the next park. If participant is incorrect, he must wait a turn before moving to next park.
4. Object is to see which student can tour the National Parks system in the shortest time.

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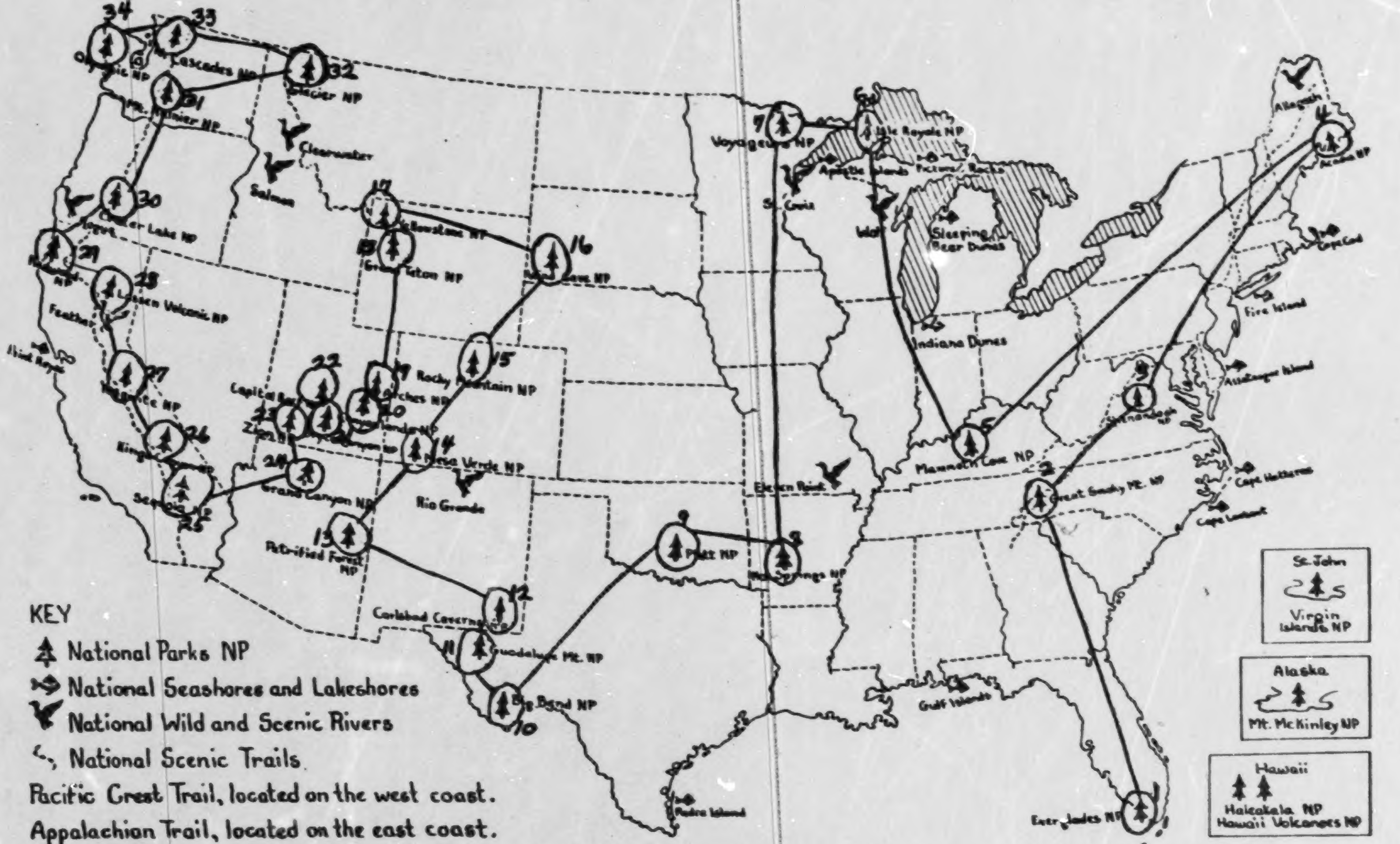
# Map of the United States showing The National Parks—National Seashores and Lakeshores—National Wild and Scenic Rivers —— National Scenic Trails.


34
33
Olympic NP
Cascades NP
32
Glacier NP
31
Mt. Rainier NP
Clearwater
Salmon
30
Rogue
Crater Lake NP
29
NP
28
Lassen Volcanic NP
Feather
Point Reyes
27
Yosemite NP
26
Kings Canyon NP
25
Sequoia NP
24
Grand Canyon NP
23
Zion NP
Capitol Reef
22
21
20
Canyonlands NP
19
Rocky Mountain NP
Arches NP
18
Grand Teton NP
17
Yellowstone NP
16
Wind Cave NP
15
14
Mesa Verde NP
Rio Grande
13
Petrified Forest NP
12
Carlsbad Caverns NP
11
Guadalupe Mt. NP
10
Big Bend NP
9
Platt NP
8
Hot Springs NP
Eleven Point
Padre Island
7
Voyageurs NP
St. Croix
6
Isle Royale NP
Apostle Islands
Pictured Rocks
Wolf
Sleeping Bear Dunes
Indiana Dunes
5
Mammoth Cave NP
4
Acadia NP
Allagash
Cape Cod
Fire Island
Assateague Island
3
Shenandoah NP
2
Great Smoky Mt. NP
Cape Hatteras
Cape Lookout
Gulf Islands
1
Everglades NP
St. John
Virgin Islands NP
Alaska
Mt. McKinley NP
Hawaii
Haleakala NP
Hawaii Volcanoes NP
KEY
National Parks NP
National Seashores and Lakeshores
National Wild and Scenic Rivers
National Scenic Trails
Pacific Crest Trail, located on the west coast.
Appalachian Trail, located on the east coast.

# ENVIRONMENTAL FEELINGS IN CHILDHOOD

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9,10)

With a very little help from
The Project Staff

March, 1975

# A NOTE TO TEACHERS AND PARENTS

> *We walked this afternoon to. . .Walden Pond. The south wind blew and filled with. . .warm light the dry and sunny woods. The last year's leaves blew like birds through the air. As I sat on the bank. . .and saw the amplitude of the little water, what space, what verge, the little scudding fleets of ripples found to scatter and spread from side to side and take so much time to cross the pond, and saw how the water seemed made for the wind and the wind for the water, dear playfellows for each other, -- I said to my companion, I declare this world is so beautiful that I can hardly believe it exists.*
>
> --Ralph Waldo Emerson
> Journal entry for April 9, 1842

Emerson and Thoreau on the banks of Walden Pond feel. They express their feelings about natural phenomena which convey their sense of intimacy and mutuality. As one reads the works of environmentally aware persons, both historical and contemporary, their feelings and fundamental dispositions toward nature spring forth from the pages. Yet, for some reason, emotions have gotten a bad press in education, including environmental education. Emotions are rarely mentioned, as though feelings might some how taint our conceptions of ourselves as rational beings and "problem-solvers." Our feelings of joy and fear, remorse and ecstasy, awe and guilt, wonder and life, are to be ignored or suppressed to get on with "real learning."

Rather than take a pejorative view of emotions, this booklet offers sample activities which place feelings at the center of environmental education experiences in childhood. The activities are presented for you to try out with children and to draw your own conclusions. Hopefully, you will be encouraged to develop similar learning activities which help students to confront their emotions in satisfying ways, while learning about their place in the natural environment.

## Contents

A. Pictures and Feelings Exercise 3
B. Contrasting Pictures Exercise 7
C. Environmental Feeling Stories 11
D. Environmental Feelings Game 11
E. Collage of Activities 14
F. Food Chain Simulation 15

## A. PICTURES AND FEELINGS EXERCISE

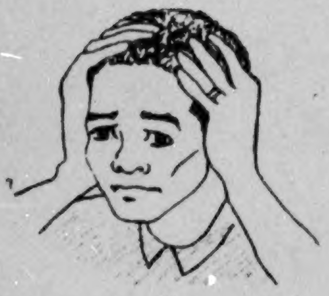
This exercise is a warm-up experience for students who have not dealt with discussions and identifications of feelings before. The opening activity should involve students in looking at various pictures of human situations and talking about the feelings which are shown and the reasons why the persons shown might feel the way students say they do. The next page (page 4) offers some examples, but teachers might cut much better examples out of magazines --in full, living color! Or teachers might ditto copies of page 4 for their students.

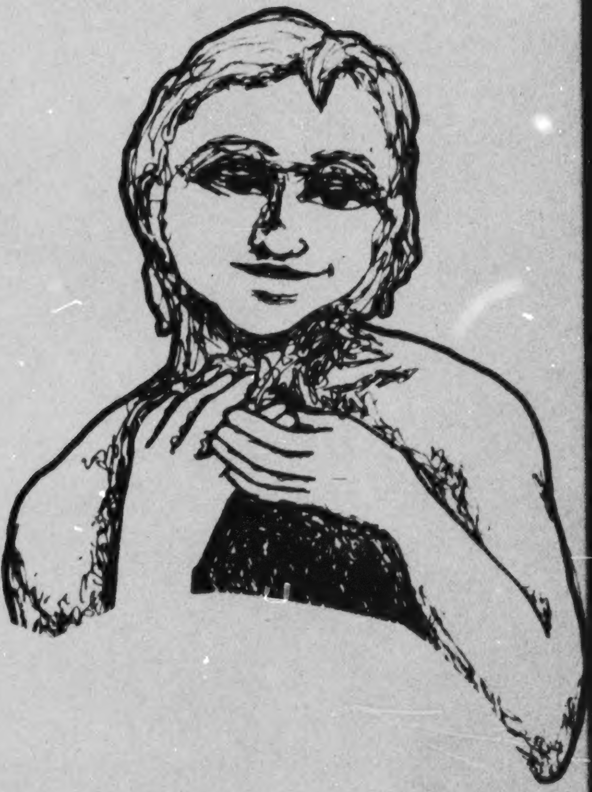
Page 6 offers pictures of animals for the students to identify possible feelings which the animals might have --and the reasons why animals might have the feelings identified. Again, this page may be dittoed for students --or teachers might cut better color pictures from magazines.

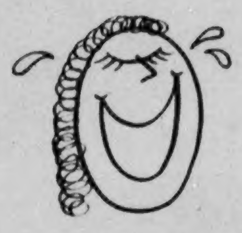
The teacher might structure the class discussions like the following --reprinted from the Primary Environmental Education Project (PEEP), University of Georgia, Athens, 1974.

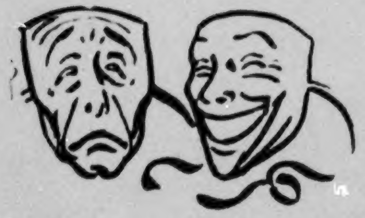
Behavioral Objectives and Focusing Questions removed to conform with copyright laws.

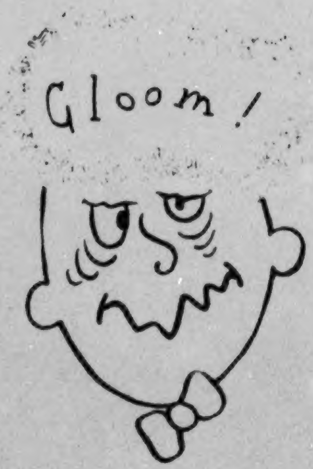
HOW DOES EACH PERSON FEEL?

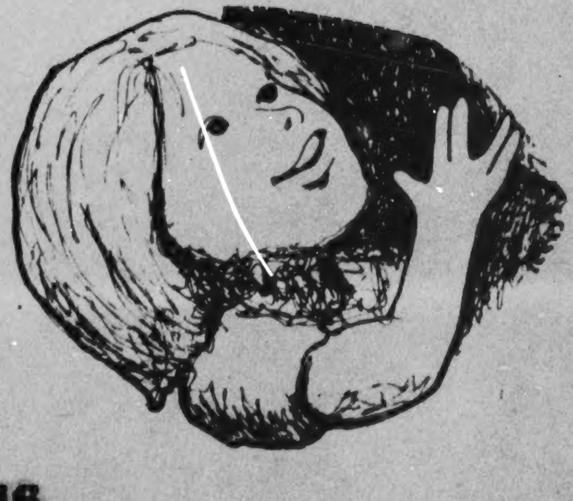


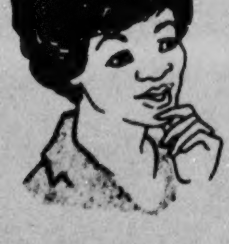




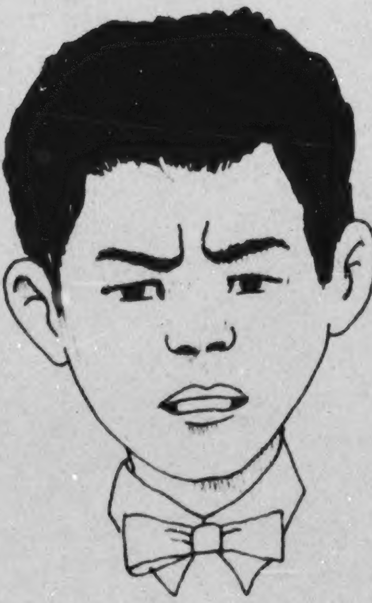


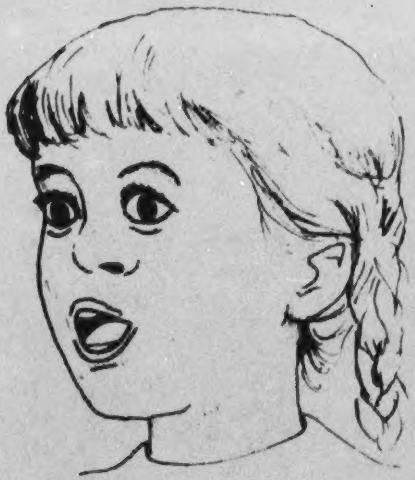


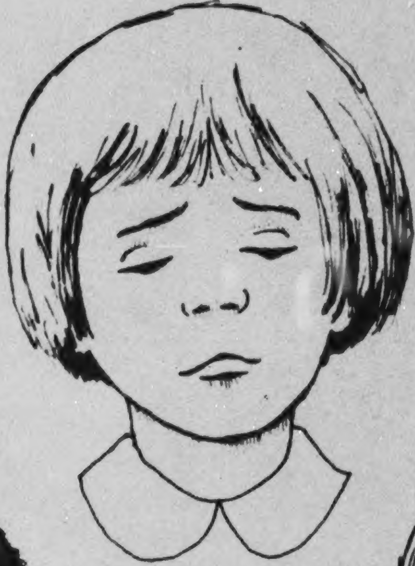


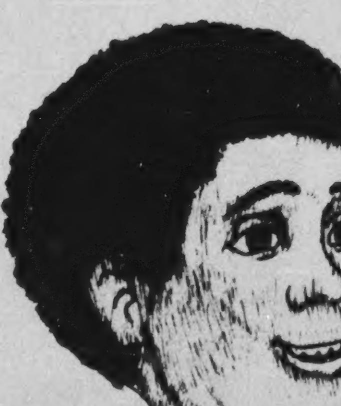


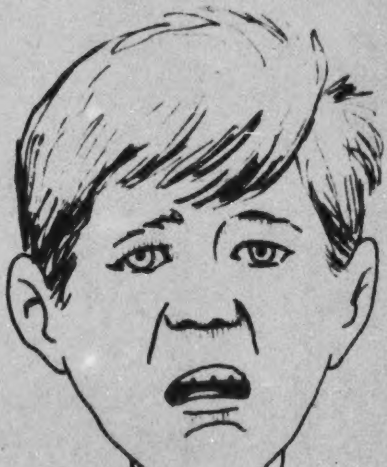
HOW DO THESE PEOPLE FEEL?
HOW DO YOU KNOW?



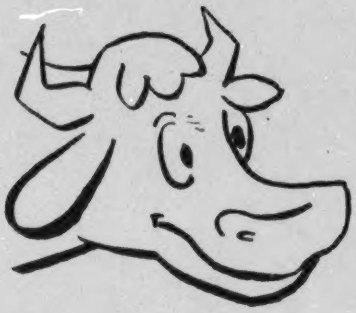


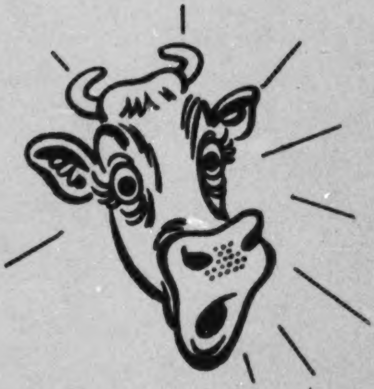


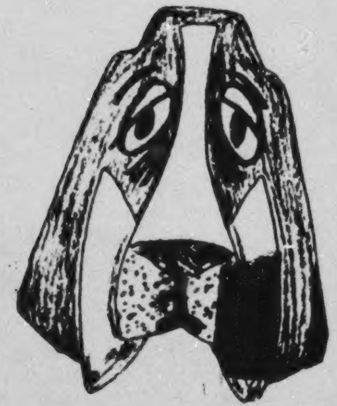


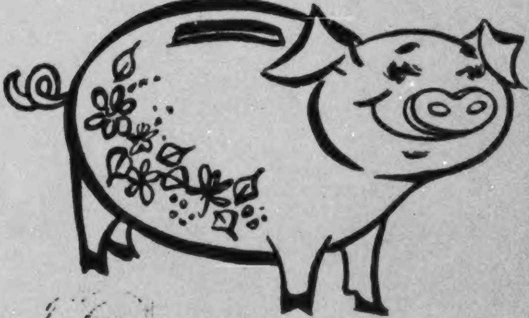


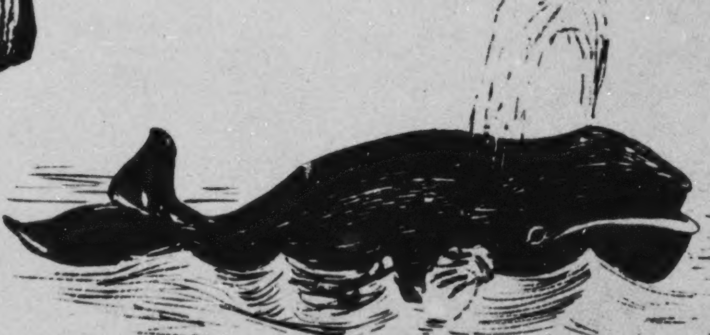
## HOW DOES EACH ANIMAL FEEL?

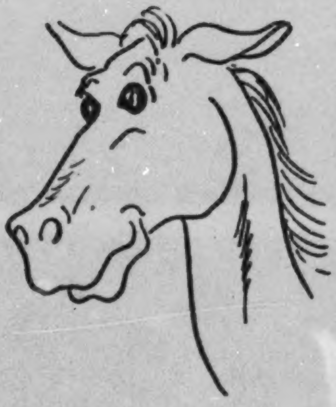


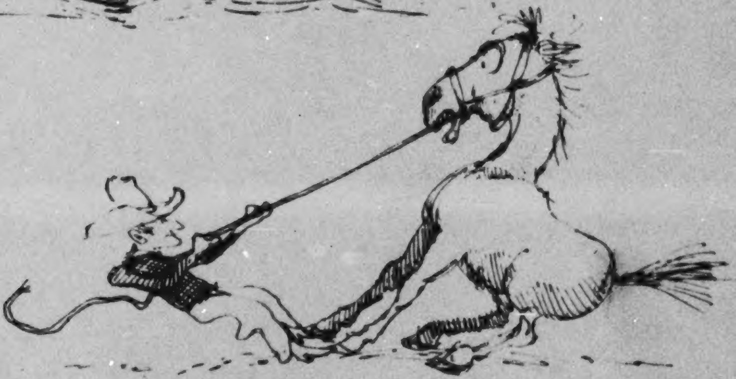






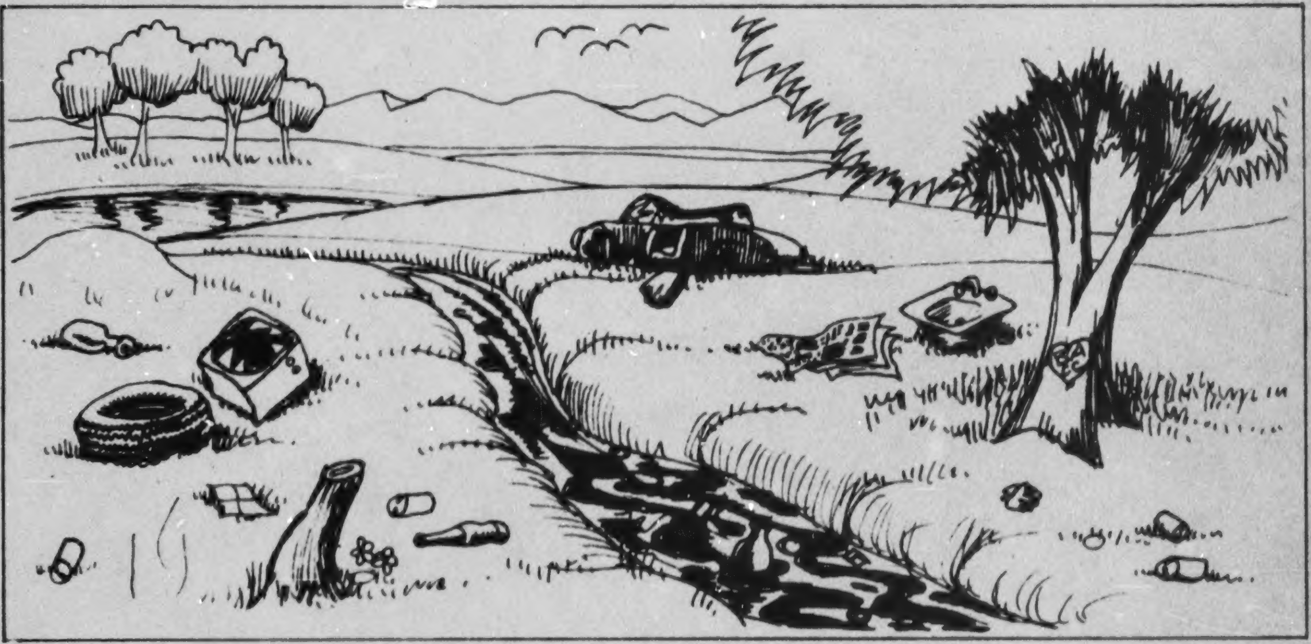


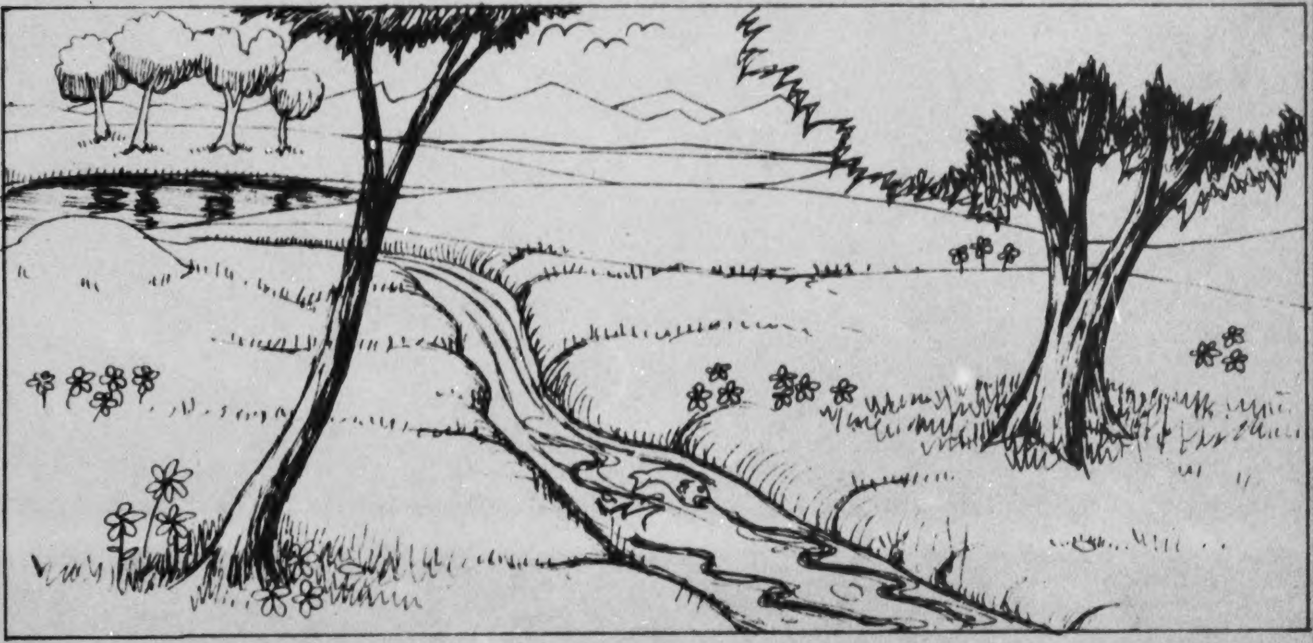


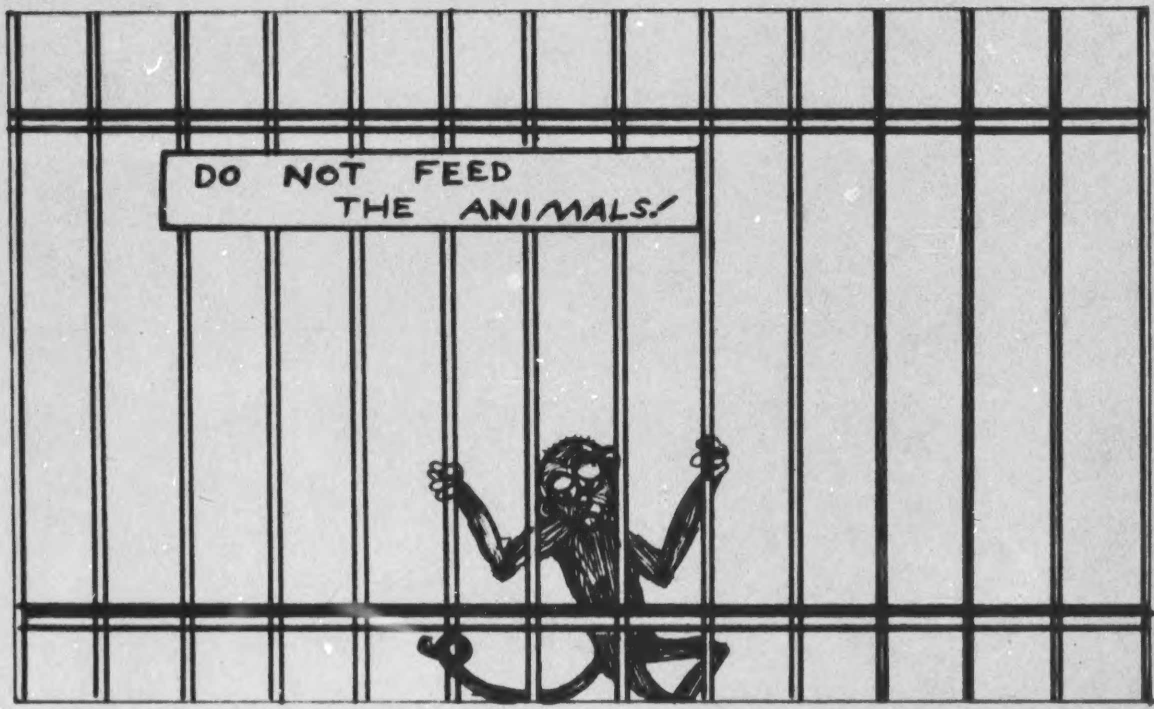


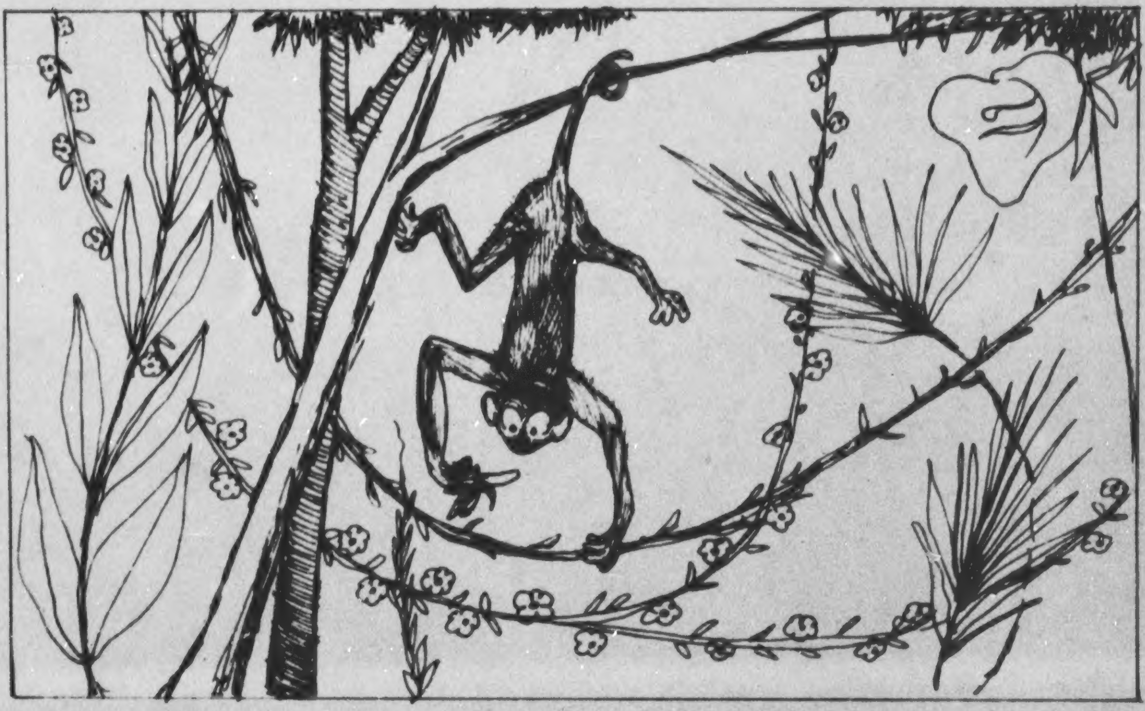
## E. CONTRASTING PICTURES EXERCISE

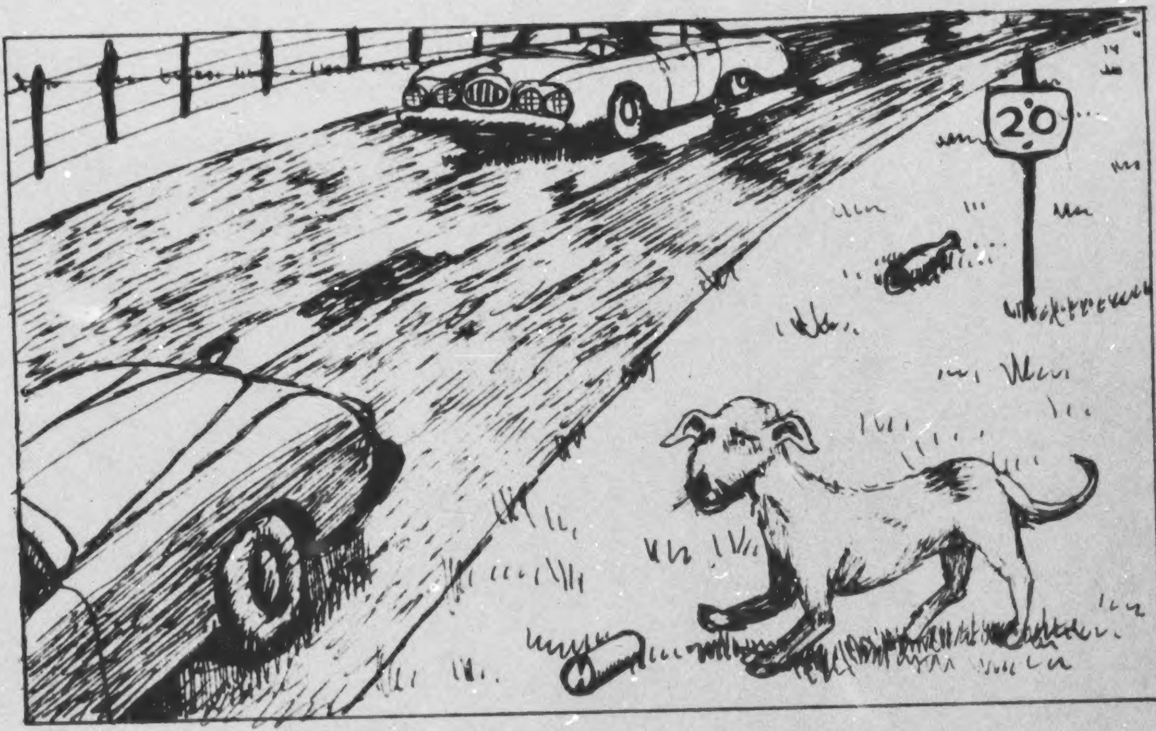
This exercise uses contrasting pictures so that students might learn some feeling words and discover their different feelings about contrasting environmental scenes. Four pairs of contrasting pictures are provided below. Teachers might ditto these pages, or find and mount better contrasts from magazines. Try to have students master these feeling words: Happy, Sad, Surprised, Excited, Afraid, Frightened, Worried, Angry, Wonder.






DO NOT FEED
THE ANIMALS!

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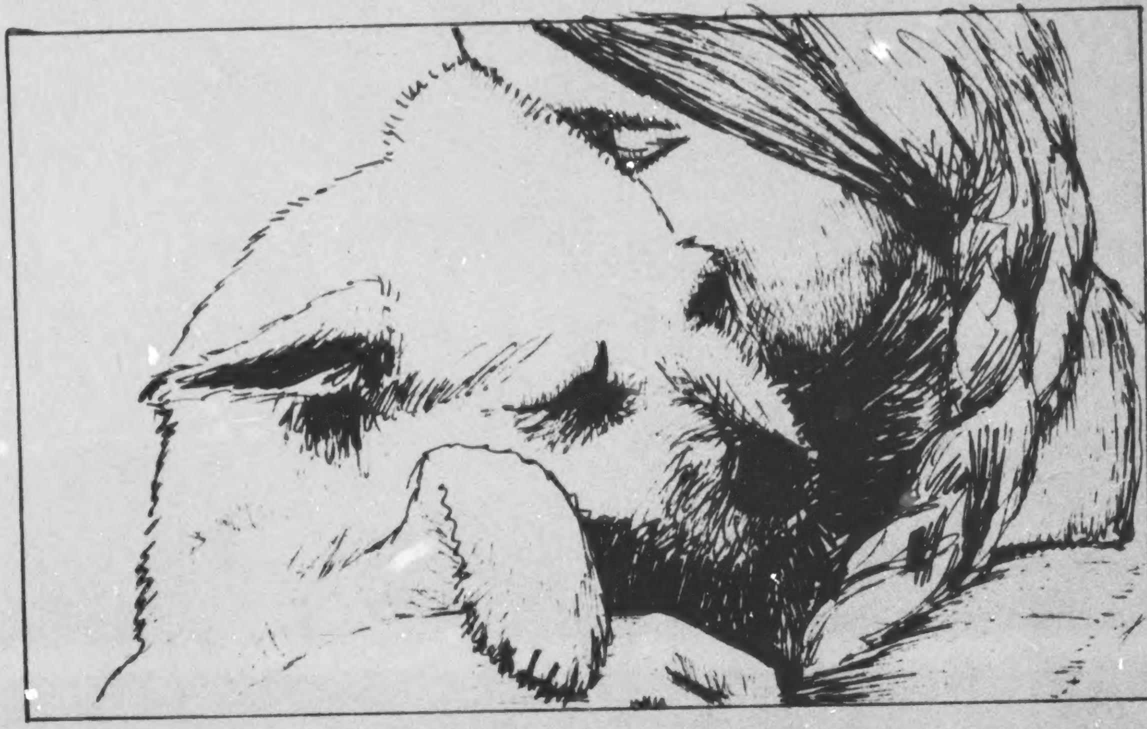


## C. ENVIRONMENTAL FEELING STORIES

Story-telling is a traditional, and superb, way to involve students in discussion. Teachers can draw upon stories from volumes in the library which deal with environmental themes, or can make up their own tales. In addition, children have a rich experience which they might relate to one another.

For our purposes here, the stories which involve expressions of feelings or elicit feelings from the listeners are most helpful. An example, the story of an "Old Dog," is printed below. After each story, teachers would raise questions about the feelings involved, similar to those questions given in Section "A."

### Old Dog

*Helen saw a boy kick Toby, Joe's dog. "You stop that," Helen screamed, jumping to her feet. "Here, Toby," she called, "come on, boy!" Toby ran whining and crying to Helen. She knelt beside him and hugged him close.*

*Joe went over to the boy. "What do you think you're doing?" he demanded. He was furious.*

*"That dog splashed all over me," the boy said. "You'd better make sure he doesn't bother other people!"*

*"Yeah? Well, we'll see how you like being kicked," Joe threatened.*

*What do you think Joe should do to the boy who kicked his dog?*

*The teacher will initiate a class discussion based on the following questions:*

1. *What emotions are shown?*
2. *What do you think Joe should do?*
3. *How would you have reacted?*
4. *Why did Joe react this way?*
5. *Have you had a similar experience? How did you feel? Why?*

## D. ENVIRONMENTAL FEELINGS GAME

This little game involves students in acting out their emotional response to a variety of environmental situations. Each situation is described on a card which a student draws and then acts out before the class. Following the acting, other students state the emotions which the actor felt. The actor points out the person who came closest to naming the emotion and that person selects a card and acts out his/her feelings.

Rules:
1. Pick a card and read it. Give it to the teacher who will read it to the class.
2. Act out the situation, expressing your feelings.
3. When you are finished, ask the class "How did I feel?"
4. Pick the student who comes closest to your feeling and that person will play the next card.

You go with your grandfather to his favorite fishing lake and find litter all over the place -- cans, bottles, old tires, and trash!

You are visiting a friend overnite and cannot get to sleep because of all the noisy trucks and cars on the highway near her house!

After a rain, you are walking with friends and Billy suddenly squashes a worm which crawled up on the sidewalk!

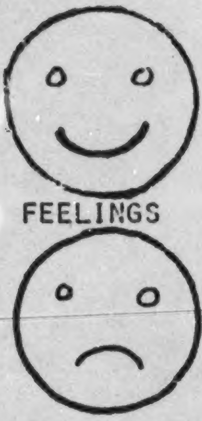
You are playing in a park when you see a girl about to shoot at a little bird with her BB gun (air rifle)!

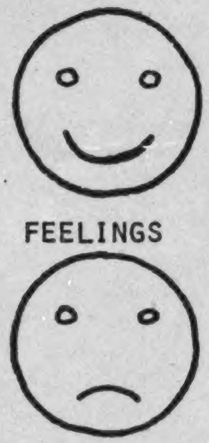
You are out working in the yard when your brother grabs the neighbor's cat by the tail and swings him around in the air!

Right in the middle of your reading group, you see a big, black roach running across the floor toward you!

You are out for a ride in the family car enjoying yourself when suddenly you smell this terrible odor from a big factory!

You are walking in the forest with your family and you come upon a dead bird!


FEELINGS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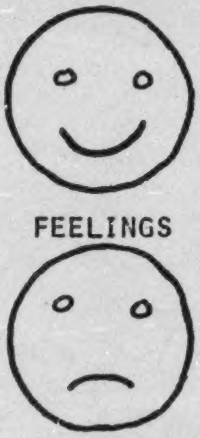
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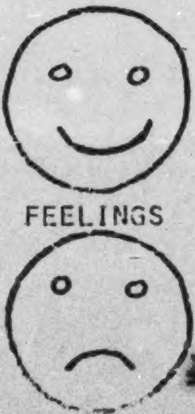
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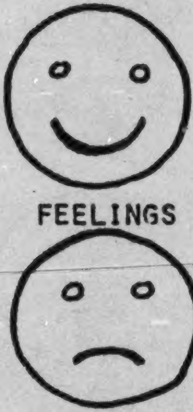
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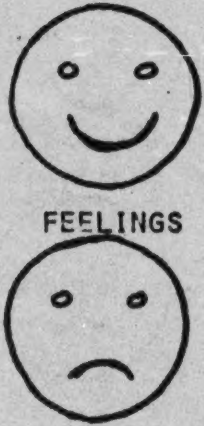
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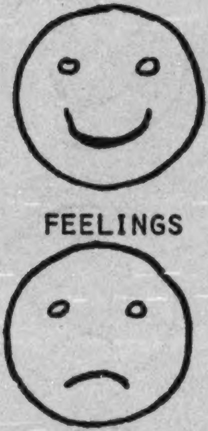
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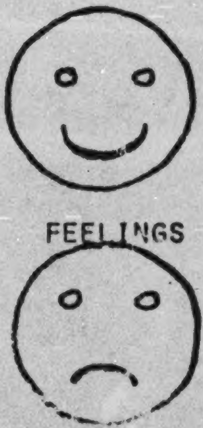

FEELINGS

You get up one winter morning and look out of your window to see the world covered with snow!

Oh, my! It is night-time and you can't remember if you fed the fish and plugged in the heater for your classroom aquarium. This was your job!

You have been watering and carefully caring for the window plants in your classroom, but for some reason they are dying!

You are sitting looking out the window when you see a chameleon -- and it changes color right before your eyes!

You walk out to the garden with your mother and discover the first plants just growing up, out from the earth!

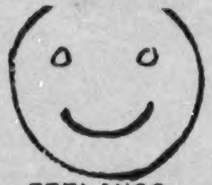
You are eating your lunch with friends, under a tree in your backyard. A spider swings down from a branch right over your head!

(bee)
(mosquito)
(fly)

You are out walking in the woods with your uncle when you see Shep, your uncle's dog, with his foot caught in a big, steel leg trap!

(a rabbit)
(a deer)
(a person)

Fire ants are building mounds in your school yard and the school janitor wants to go out and poison them!



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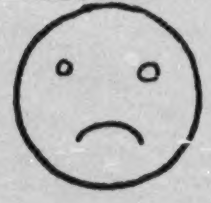

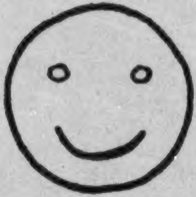

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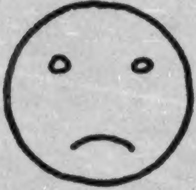

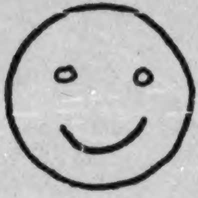

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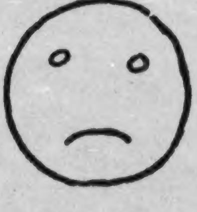

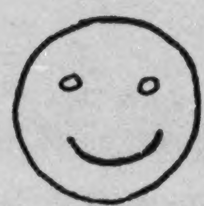

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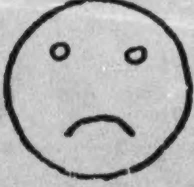

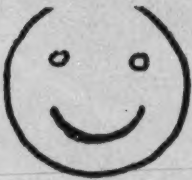

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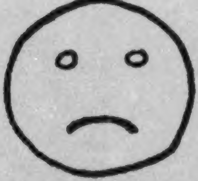

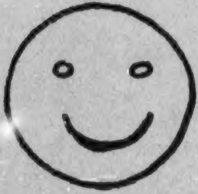

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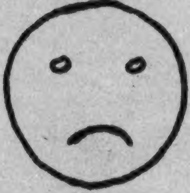

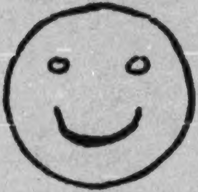

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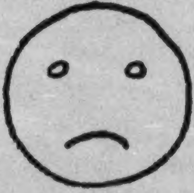

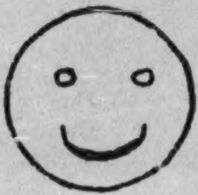

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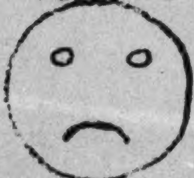


## E. COLLAGE OF ACTIVITIES

1. Treasure Hunt. Divide your classroom into small groups. Each group is given a piece of the paper with the following words on it: SAD, HAPPY, SICK, ANGRY, SURPRISED, FRIGHTENED, BEAUTIFUL. Each group is instructed to go out-of-doors and find something that (to them) fits with each word. This is a non-competitive activity, so, if a group finds two things which go with ANGRY, they might trade with a group that has two of something they need. (Teachers might substitute words for a repeated use of the activity).

2. ME-Chart. Given pieces of newsprint or butcher paper, paste, scissors, and a huge pile of old magazines, students might do a collage on the theme "ME IN NATURE." After sharing their ME-charts, students might do a treasure hunt, going out-of-doors to get some items which "are like me" or "remind me of me."

3. Songs and Music. Teachers can use instrumental music from their own collections or from the school library to play in class, letting children act out the feelings suggested by the music: a tree in a big forest with plenty of wildlife, a fish in a rough sea, an oak tree alone on a high hill with a thunder storm coming and the wind blowing, etc.

   Teachers can also use vocal music from their own collections or by letting students bring their own records to class. Students could listen to "The Big Yellow Taxi," or Johnny Nash's "I Can See Clearly Now," followed by a sharing of the feelings aroused by the songs. The following song by Pete Seeger is a superb example:

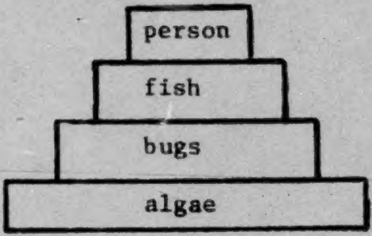
Song, "God Bless the Grass" by Pete Seeger, removed to conform to copyright laws.

## F. FOOD CHAIN SIMULATION

The following simulation of the food chain is designed to elicit student feelings for discussion.

Equipment Required: Chalk and Chalkboard
A bag of white beans and a bag of black beans
Student-made symbols for their group in the food chain.

Introduction: Draw the following diagram on the chalkboard and explain the food chain. The algae takes nutrients in the water to grow. The algae is food for bugs, who, in turn, are food for fish, or are, in turn, food for persons.*



| | | | |
|---|---|---|---|
| person | 1 | 2 | 4 |
| fish | 2 | 4 | 8 |
| bugs | 3 | 6 | 12 |
| algae | 4 | 8 | 16 |
| | (10) | (20) | (30) students |

Directions:

a) Divide class into four groups with the proportions noted above. Any extra students should be placed in the "algae" group.

b) Each student (except those in the "person" group) should be given a handfull of white beans.

c) Explain to children that groups can proceed to get "food" (beans) from the group immediately below them. Let students do this for about ten minutes.

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d) After five minutes the teacher should stop the class. Inform the students that persons have polluted the environment; give one handfull of black beans (pollution) to each person in the algae group. Tell them that they can pass the beans up the food chain as others come for beans! If they do not get rid of the pollution beans this way, they will die immediately.

e) Renew the groups requesting beans. (Remind the "bugs" and the "fish" that they can also pass the black beans up. Each "person" who gets a black bean dies.** When there are no more "persons" then each "fish" who has or gets a black bean dies, then each "bug" and so forth.)

f) When only the algae group is left standing, those with black beans "die" too.

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

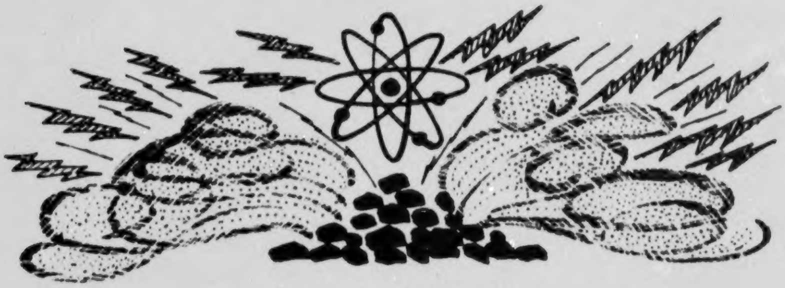
g) Discuss student feelings about this activity--and the impact of pollution.

*Food chains have various trophic levels that energy passes through. As the energy goes from one level to another only about ten percent is transferred. Thus, 1000 units of energy at the algae level transfer 100 units to the bugs, who transfer 10 to the fish who transfer one unit to a person.

**One "dies" here by sitting down! The teacher should point out that students "die" with a black bean, and by getting no beans at all. They must ask for beans and they must accept black when given!

# ENERGY AND ENVIRONMENT

## --learning activities for camp and home--



Neal Berger
Science Teacher, Carabelle High School
Donna Berger
Home Energy Specialist
Ron Goley
Policy Consultant, Florida Energy Committee
Betty Klein
Jan Rounds
Petroleum Allocation and Energy
Conservation Office

With the Project Staff

April, 1975

# INTRODUCTION

Have you ever considered the importance of changing wasteful energy habits? Or the many ways that this can be done? Probably not, because Americans have grown up assuming that energy, especially oil and natural gas, would always be available and inexpensive.

In the last year or so, particularly since the oil embargo, we have had a rude awakening; energy may not always be available, and it may never be cheap again. This is a critical factor for Florida, since we import more than 90% from other states or countries.

If this is the case, is there something we can do to eliminate energy waste and use energy more efficiently? The answer is a definite yes. There are many things, big and small, that we as individuals, as families, and as a nation can do to conserve our natural resources and energy.

The purpose of this booklet is to create an awareness of the ways energy is used at the campside, at home, at work and at play. By participating in a number of experiments and games, and using energy saving tips, you then will be able to understand the value of using energy wisely. Remember, as you go through these experiments and games, many things learned at camp will have equal use once you return home. For example, the use of trees to shade a tent or cabin has similar effects on a home. Use of this natural system saves money and energy by reducing the strain on a home cooling system.

Each chapter in the booklet has a particular focus but all are related by the common thread - energy. The first chapter, "The Camp as an Eco-System" is designed to help you look at the campsite in terms of its energy systems, both natural and man-made (physical plant) systems.

The next chapter, "Energy Projects at Camp," will provide a series of experiments in which solar energy, for example, is utilized through the construction of a parabolic mirror for cooking. Such projects will give you first hand experience in using alternative forms of energy.

"Energy and Consumerism," the third chapter, will show useful hints for more effectively using appliances in and around the campsite and home on a day-to-day basis. Remember, these hints, which each of you can adopt, make up energy-saving habits. That means money saved as well as energy and natural resources.

The final chapter is a story about recreation vehicles. You will have the chance to make decisions about the environment and energy based on your values. By using a little common sense, we can all enjoy the use of recreation vehicles and conserve energy at the same time.

We hope this booklet will be helpful in creating an awareness of the impact energy has on your lives. Participation in the various games and experiments will give you firsthand knowledge of energy systems which you can use at home. Enjoy camp and learn to use energy wisely and efficiently.

## *THE CAMP AS AN ECOSYSTEM*

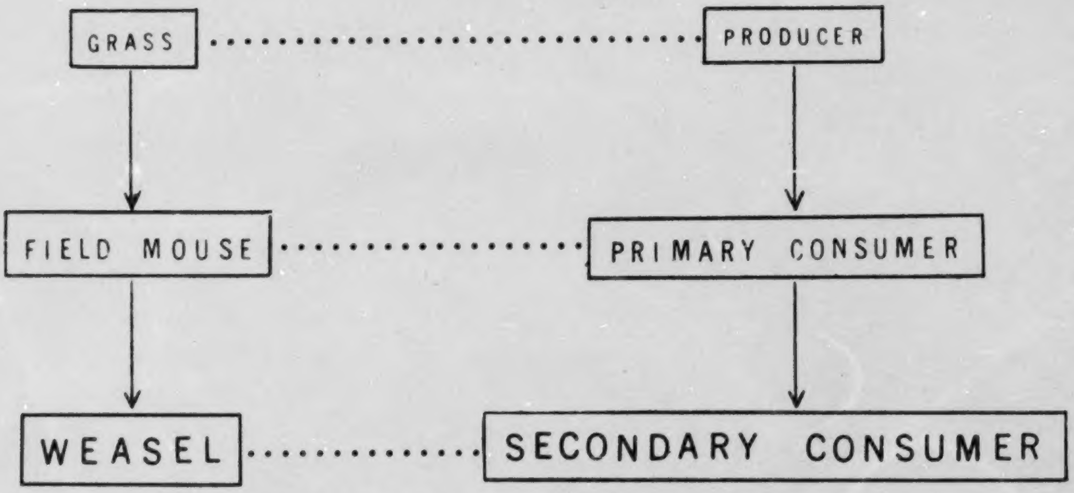
The study of ecosystems is the study of energy flow. Look at your camp in terms of two kinds of energy flow: naturally supplied, and man-supplied.

### Natural Energy Flow

This diagram represents a "food chain." It is a simple way of outlining the movement of matter and energy in a system. In this case, for example, a field situation is depicted in which the predominant vegetation is grass. Since it produces its own food, the grass is referred to as a PRODUCER. Field mice, which may be present in the field, obtain their matter and energy by feeding on the grass. Because the mice feed upon the producers, they are referred to as PRIMARY CONSUMERS.

At the next level, there may be a weasel feeding on field mice. The weasel, then, takes its required material from the bodies of the field mice that it eats. The weasel is referred to as a SECONDARY CONSUMER, the consumer who feeds upon a primary consumer.

FOOD CHAIN



This is just an example of pathways in a food chain in which material may be transferred from one level to another. Notice in any one of these examples that the original source of material, both matter and energy, goes back to the producer. If you go back far enough in the food chain, you will find that every organism is dependent upon green plants as its source of both matter and energy. Without green plants, living systems could not exist.

The food chain concept is an oversimplification of what really exists in nature. If we go out into the field we were just referring to, there are other feeding relationships involved besides the simple ones just explained.

For example, the field mouse that was feeding on the grass and was called a primary consumer, in addition, may feed upon insects. The mice, then, will feed on animal material as well as vegetable material. Therefore, there is an interaction here. Not only does the field mouse act as a primary consumer, but it may also act as a secondary consumer. It may act at several levels in the food chain.

## Exploring Your Camp's Natural Food Chain

Divide into teams of 3 to 6 persons and take a field trip to inventory producers, primary consumers and secondary consumers found around the camp.

Designate one person the recorder. The correct common name of animals and plants must be recorded on the proper energy level. Remember that some consumers may occupy more than one level. The charts might look like this:

Natural Energy Inventory
Camp Apple

| Producer | Primary Consumer | Secondary Consumer |
|---|---|---|
| Wax Myrtle | Field Mouse | Owl |
| Slash Pine | Cardinal | Dog |
| Wire grass | Aphid | Tree Frog |
| Live Oak | Flying Squirrel | Flying Squirrel |

After a specified period of time, assemble the teams and have them compare charts. Each team can challenge another team's placement of an animal or plant in the energy category.

The team with the greatest number of correct names and the proper placement wins.

Questions:

1. Are there more producers, primary consumers or secondary consumers? Why?
2. Explain how all life ultimately depends on green plants.
3. Plants convert solar energy to food energy through the process of photosynthesis. Scientists estimate that less than 10% of the solar energy reaching the earth is used. Why? What happens to the other 90% of the energy?
4. Design and construct a plant that would be more efficient than any plant currently found on earth.

The most obvious source of energy in man-made ecosystems is electricity. Begin with sunlight and trace the energy flow to a light bulb.

Another artificial source of energy involves transportation in and around and to and from the camp.

Survey the number of petroleum-using motors and/or generators at camp. Estimate the weekly consumption of each; total the figures to obtain a weekly consumption rate for the camp.

List at least five ways of reducing this energy consumption and present your suggestions to the camp director.

Estimate the amount of fuel used to bring you to and from camp. How much did it cost? If you had that much money, what could you buy? Would you rather buy something than come to camp? Suggest ways to reduce the amount of energy used to transport campers to and from home.

A third source of imported energy is food. Could the natural productivity of this site support the camping population? Why or why not? Copy the camp's menus for one day and place each item in its proper energy level. A rule of energy flow in both natural and man-made ecosystems is that energy is lost when it is changed from one form to another. For example, when people eat corn they receive 100% of the energy in the corn. When the corn is fed to a pig and people eat pork chops, they only get about 10% of the energy contained in the corn. The rest is lost as heat.

Review the menus and change them to reduce this energy loss by 10%; by 25%. What would you have to do to eliminate the loss completely?

## *ENERGY CONSERVATION PROJECTS AND ACTIVITIES FOR CAMPS--A SAMPLER*

Here is a sampling of inexpensive energy conservation projects and activities which can easily be integrated into your existing camp program. A camping program can be recognized as an "energy microcosm" of our society. We are generally unaware of the multitude of daily energy decisions we make at home, but at camp it is easier, and often more important to be aware.

Children arrive at camp already curious about their environment and aware of several different energy situations which exist at camp as compared to home. For example, they expect at camp different lighting, different uses of electricity, no hot water, hand instead of power tools, canoes instead of motor boats and hikes instead of auto trips. Most of the activities at camp require your own body's energy and creative participation rather than fossil fuel energy and spectatorism. The fact that many children can do without high energy activities, and yet enjoy themselves, perhaps is proof that we can be happy with less high energy conveniences.

Perhaps the best time to try out these projects and activities is before the campers arrive, during staff orientation. This will allow the new staff an opportunity to work together in problem solving situations, familiarize themselves with the camp layout, and create confidence in using an activity approach. Of course your staff will become more energy conservation minded, and that might help you to economize in high energy use areas.

Keep in mind that what is learned at camp about energy conservation is not theoretical; it is practical and often immediately useful in everyday living situations. Energy lessons learned at camp are not easily forgotten; they may be transferred to home situations.

### BEAT THE HEAT!

Overview: "Home" at camp can be anything from a leaky tent to a cabin with hot running water, showers and electric lights. Because you feel it's yours, it's a good place to start discovering about energy and conservation.

Directions: Duplicate or cut out the following problem situation cards and distribute them to your campers. Decide on a reasonable time limit and group size. Turn the group loose and let it figure out the problem and solution. Don't help too much. Remember safety!

Equipment: Most of the equipment is easy to secure. Several household thermometers need to be obtained beforehand.

---

Situation 1 HOT SPOTS

USING THE "HOME" AT CAMP FIND AN ANSWER TO THE FOLLOWING:

A. With a thermometer, find the hottest and coolest places inside your camp dwelling.
What is the highest temperature you found? Where is it?

What is the lowest temperature you found? Where is it?

B. Explain why you think the highest and lowest temperatures were found where they were.

C. Would you expect to find the highest and lowest temperature in the same locations at different times of the day? Explain.

D. Meet with the Situation 2 group when you are through.

Situation 2 A HOT HOUSE!

USING YOUR "HOME" AT CAMP FIND THE ANSWER TO THE FOLLOWING

A. With a thermometer, find the hottest and coolest places outside.
What is the highest temperature you found? Where did you find it?

What is the coolest temperature you found? Where did you find it?

B. Explain why you think the highest and lowest temperatures were found where they were.

C. Would you expect to find the highest and lowest temperatures in the same locations at different times of the day? Explain.

D. Meet with the Situation 1 group when you are through.

Group Meeting, Situation 1 and 2 Groups

A. Report your methods and results to the other group. What similarities and differences exist between the hot and cool areas, inside and outside of the living area?

B. Figure out 3 different ways to make your living area cooler during the day and night without man-made energy sources.

C. With your counselors' help, try any one of the solutions

OTHER PROBLEMS TO SOLVE:

1. Find three inexpensive, energy saver ways to bring more light into your cabin.
2. Investigate how landscaping can help keep your building or tent cooler.
3. Describe three ways in which you could make your home cooler without expending unnecessary energy.
4. Find the coolest building or shelter in camp. Decide why it's so comfortable.
5. From an energy point of view, why is it important to consider where your camp will be located?

## PITCH IN!

Here's one to try on a campout. Don't forget to bring some inexpensive thermometers with you.

Divide your group into teams, based on the number of tents you have. (1 team per tent).

Offer a prize for the team that can set-up:

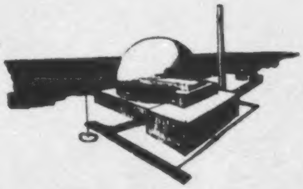
 A. The coolest tent at night
 B. The coolest tent during the day
 C. The warmest tent in the morning
 D. The tent with the best AM lighting

A. The winning team should explain the factors that contributed to their winning.

B. Other problems to solve: determine how each factor contributes to tent temperature:
 tent color, number of people in tent.

C. How will these help keep your house cool?

 1. Orientation of house to sun
 2. Roof color
 3. Insulation
 4. Ventilation
 5. Number and location of windows
 6. Closeness of room to furnace or air conditioner
 7. Oven going in kitchen
 8. Trees around house
 9. Curtains in windows
 10. Window awnings



## MINI-FIRES AND WATER BOILS

Nearly everyone knows how hard it is to cook and sit around a very large campfire. Even so, many campers continue to build larger fires than are needed for cooking, heating or lighting. Here are some activities related to fires which can teach a great deal about wise energy use and conservation.

1. As a unit build the smallest fire possible to boil a cup of water. (You could either use your metal cookset or an actual paper cup!!)

2. Consider the importance of the following:

   a. where the fire will be built.
   b. type of fuel.
   c. the effects of wind on heating time and fire size.
   d. size of the water container.
   e. type of water container.

3. Discuss the implications of your discoveries to cooking at home.

## SPACESHIP YOU

You've probably heard that our earth is like a spaceship. In what ways is this so?

You too are like a spaceship when you are out on an overnite hike. You need to bring along the proper supplies, think ahead because you can't easily turn back when the going gets rough, etc.

Energy conservation means the wise use of energy, not wasting and managing comfortably without.

What types of energy conservation problems would you have in each of these categories, related to an overnite camping trip?:

A. Food: type, containers, ease in preparation, refrigeration
B. Cooking: fuel, cooking utensils
C. Shelter: type, weight
D. Sleeping-bag, pads and insulation
E. Trail taken to your destination
F. Other

How would the problem of energy conservation be different if this hike were for 5 days?

Describe 10 ways in which you could reduce energy use at home, based on what you've discovered out here.

## ENERGY ETHICS - A Game

Directions: Each member of your group is given an energy situation card. The card should be read aloud, and a choice made which you will defend to the rest of your group.

You are then rated from 1-5 by your group for how well you have defended and explained your position. 5 for excellent and 1 for inadequate.

Then: The same person is given a Mind Modifier.
He has 1 minute to defend or change his position.
Then the group re-rates this person.

Each person in the group goes in turn and is rated. The individual with the highest score is declared winner.

Sample of Score cards: (Each member of group has one.)

| Initials | 3 minute scores 1-5 | 1 minute score 1-5 | Total score |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

Cut out or duplicate each of the 8 situation cards which follows:

---

Situation Card #1 SKI BOATS OR CANOES

There is money available for the camp to either buy a ski boat or five canoes for use on your camp lake. You must decide how the money is to be spent. Which of the following would you prefer:

A. Get the ski boat since you never tried skiing and besides power boats are more fun.
B. Get the canoes because they are quieter, more fun, and use no fuel.
C. You are not interested in making a decision in this matter.
D. Other. . .

---

Situation Card #2 ELECTRIC LIGHTS IN YOUR CABIN?

When it gets dark, its impossible to see or read in your cabin without a flashlight. Would you:

A. Ask for electric lights.
B. Continue to use your flashlight and not complain because camp is better without lights.
C. Go to sleep when its dark and not worry about having no light for reading.
D. Other. . .

---

Situation Card #3 POWER TOOL OR BODY POWER?

Your unit has planned a Nature Trail. You will need to remove some shrubbery and small trees. Should you:

A. Use power tools, because they save time and work, even if they require gasoline to run.
B. Use no power tools, instead use your own energy to do the job.
C. Forget about doing the nature trail because the power tools require gasoline and without them its too much work.
D. Other. . .

---

Situation Card #4 HOT SHOWERS?!

Anyone knows showers are terrible without hot water. But your camp has no hot showers. Should you:

A. Insist on having electric hot water heaters for the showers.
B. Learn to do without hot showers.
C. Invent a way to heat shower water with the sun's energy.
D. Other. . .

---

Situation Card #5 AMUSEMENT PARK OR CAMPOUT?

Your unit is planning a day trip and you haven't yet decided to go to an amusement park 25 miles away or hike to the other side of the lake and camp out. Would you vote to:

A. Go to the amusement park.
B. Go on the overnite camping trip.
C. Try to figure out something else to do.
D. Other. . .

---

Situation Card #6 HOT DINNER!

Your camp's dining room is too hot to eat comfortably. You would try to solve the problem by:

A. Asking the director to insulate the dining room and air condition it.
B. Installing a fan system.
C. Investigate more windows in the room to help provide more drafts.
D. Other. . .

---

Situation Card #7 SEE YOU NEXT YEAR AT CAMP.

It's time to leave camp. Your parents have written to you and mentioned that they will be driving 200 miles up to get you and your belongings. There is a bus going back to your town with all the campers onboard. Would you write back to your parents and say:

A. You'd like them to drive up because you miss them and their car is air conditioned and a lot more comfortable then the bus.
B. You'd like them to drive up but its expensive, wastes gasoline, and the bus will be OK.
C. You will ride the bus, because it will be the last time you get to see your friends.
D. Other. . .

---

---

Situation Card #8 GO KARTS OR CANOEING?

You have a choice between being in two different units at camp. One does mostly hikes and canoe trips and the other water skiis and rides go carts.

Which unit would you choose and why?

---

## MIND MODIFIERS

#1. If you chose canoes your modifier is: Your camp already has enough canoes.

If you chose a ski boat your modifier is: Gas has gone up to 85 cents/gallon.

#2. Your camp has an electric generator that works on wind power.

#3. Another camp will help you on this project.

#4. Your counselor knows how to build an inexpensive solar water heater.

#5. A bus is available for the trip to the amusement park.

#6. Your parents have the money to donate for the dining room air conditioner.

#7. Your parents live south of the camp and after camp closes your dad has his vacation. You will be visiting your cousins near the camp.

#8. Your best friend is in the other unit.

---

## WATER EVERYWHERE AND NOT A DROP TO DRINK--I THINK.

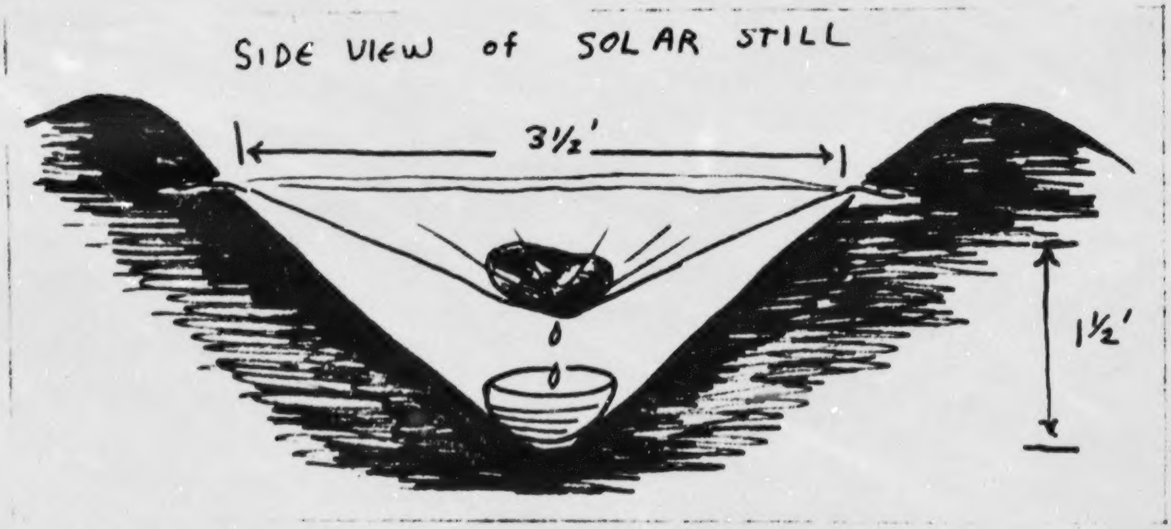
IMAGINE THAT YOUR WERE IN A LIFEBOAT OUT IN THE GULF OF MEXICO;
OR THAT YOU WERE LOST IN THE DESERT WITHOUT WATER.

The only thing you had with you was a 6' by 6' piece of plastic and a cookset. How would you obtain drinking water?

In the desert you could create a solar still --a device which uses the sun's free energy to evaporate water which will then cool, condense and collect. Here is how to set it up.

Dig a conical-shaped hole about 3 1/2' in diameter and about 1 1/2' deep. In the bottom place a container. Over the top of the hole, and sagging close to its walls, place a 6' square of thin plastic sheeting. The plastic should be firmly attached to the sides of the hole by the soil excavated from the hole. Weight it with a rock.

Since there is moisture in the sand, it will evaporate when exposed to the heated air. Hitting the cooler plastic, it will condense back into a liquid, run down the plastic and drip into the container. (See illustration, top of page 11 ).



Follow-Up Activities:

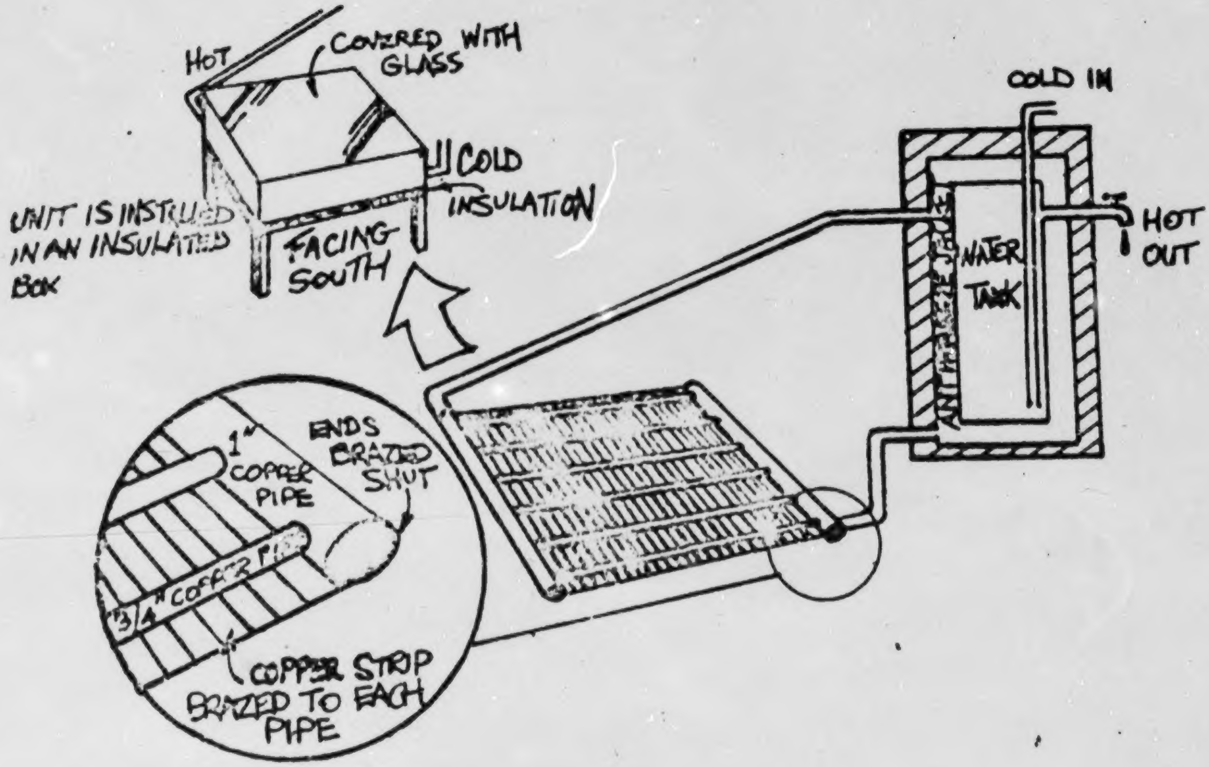
1. How would you distill the salt water from the Gulf in your lifeboat?
2. Find out how different types of plastic would affect the amount of water produced.
3. How can solar stills save energy?
4. Using a garden hose and a plastic sheet, devise a way of heating shower water with free solar energy.

## A Solar Hot Water Heater

Water is one of those interesting compounds that moves up when it is heated. This physical principle will help you build a solar-powered water heater. Increasing the surface area of the water that is exposed to the sun is the next principle that will help. This means looping the hose or copper tubing back and forth in such a way that lots of area becomes exposed to the sun. Painting the hose or tubing black will also make a big difference. Glass will insulate the heater from cooling winds and increase the efficiency of the unit.

The unit shown on the top of the next page heats antifreeze like you would use in your car. The antifreeze forms a jacket around the water tank and transfers the heat to it. This system can operate year round.

Solar water heaters are simple and have a few basic principles that govern their construction. Experiment with materials you can find around camp or home and build one - even if it is just a model or demonstrator.


HOT
COVERED WITH GLASS
COLD
INSULATION
UNIT IS INSTALLED IN AN INSULATED BOX
FACING SOUTH
COLD IN
WATER TANK
HOT OUT
ENDS BRAZED SHUT
1" COPPER PIPE
3/4" COPPER PIPE
COPPER STRIP BRAZED TO EACH PIPE

## *Energy and Consumerism*

Webster's New Collegiate Dictionary defines "consumer" as "one that utilizes economic goods." Thus, the toddler who purchases a penny piece of bubblegum, the teenager who buys a bicycle, and the housewife who does the family marketing are all consumers. And they all have something else in common, too. All their purchases represent hidden energy expenditures.

Determining the energy cost of any item is not an easy task. To do so, we must account for all flows of energy, materials, and products which enter into the process which produces the useful goods or services. The sum of the energy consumed in production can be termed the hidden energy cost. For instance, let us trace just a portion of the energy cost involved in producing a penny piece of bubblegum. One of the main ingredients used in making gum is chicle -- the latex of the sapodilla tree which grows in South America. To obtain the chicle the latex must be collected during the rainy season by tapping the tree and allowing the latex to flow into a container located at the base of the tree. It is then boiled until it becomes thick and sticky. Next, it is kneaded (squished) to press out the water, and then marketed in 20 to 30 pound lumps. To get the product to the market in the United States it must be transported from the mountains (perhaps even by llama), shipped by rail or freight to a port, and then to the bubblegum factory where it is combined with the other ingredients --sugar, corn syrup, softeners, artificial flavoring and colors. These are all high energy products. And this is still not the end of the hidden energy chain. The product is then wrapped (don't forget the energy costs involved in producing the wrapper), packed, and shipped.

Hidden energy costs can vary greatly. To produce a ticket to a distant event requires very little energy, but travelling to the event may consume a great deal of energy. Manufacturing a stereo set requires a large amount of energy, but a stereo usually consumes less energy than the lighting in the room where it is located.

Some more examples of hidden energy costs are:

| Product | Energy Required to Produce | Hidden Energy Expended in Use |
|---|---|---|
| Standard size automobile | 123 million BTU:<br>(=980 gallons gas) | Approx. 130 million BTU per year |
| $80 Bicycle | 4 million BTU:<br>(=32 gallons gas) | Once produced, a bicycle does not use up any non-renewable energy resources. |
| $100 worth of food consumed in the average home | 4.1 million BTU:<br>(=33 gallons gas) | Average energy to prepare the food is about 2 million BTU, or half as much as required for production. |

Trace the hidden energy costs in terms of fossil fuels for:

1. Producing and preserving vegetables from your own garden.

2. Preparing a cook site, gathering fuel, and starting a fire.

How many hidden energy costs can you list that are involved in the production of:

1. Fresh unshelled peas, a package of frozen peas, a can of peas.

2. A pair of polyester slacks, a pair of cotton slacks.

3. An aluminum coke can; a recycled aluminum coke can.

4. Hold a group discussion -- Are there some products whose hidden energy costs are so great that they outweigh the value of the product? (How about that penny piece of bubblegum?) How many other products can you think of?

We are all aware of the necessity to compare price and quality when making a purchase, but we should keep in mind that some appliances require far more energy to operate. For instance, different models or brands of air conditioners can vary greatly in their Energy Efficiency Ratio (EER). This ratio is determined by dividing the BTU per hour rating by the watts of the appliance, i.e., $\frac{14{,}000\ \text{BTU/hr}}{1{,}400\ \text{Watts}} = 10$ EER.

The higher the EER, the more efficient the air conditioner.

Compare the following items to determine which is the most energy efficient:

1. A conventional electric oven and a microwave oven.
2. A standard 16 cu. ft. refrigerator and a frost-free 16 cu. ft. refrigerator.
3. An electric heat pump versus an electric furnace.
4. An electric percolator and a stove top coffee pot.

Use the Electricity Conservation Scoreboard on the next page to determine your home consumption of electricity. Experiment to see how much energy you can save by lowering the temperature on your water heater, turning off lights, taking showers instead of baths. How many other ways can you think of to save energy?

Electricity Conservation Scoreboard from the Florida Energy Conservation Office removed to conform with copyright laws.

Pages 15 through 18 were removed from this document prior to its being submitted to the ERIC Document Reproduction Service.

## *Recreation and Energy*

A beautiful environment, increasing leisure time and a steady growth in population all contribute to the abundance of persons participating in outdoor recreation in Florida. One outgrowth of this phenomena has been the development and refinement of various types of recreational vehicles. Many of these vehicles require inputs of our limited supplies of energy.

Motor bikes, dune buggies, power boats and air boats are just a few examples of the increasing number of "off-the-road" vehicles that technologically-oriented Floridians use for recreation. In a time of dwindling energy supplies, the use of non-renewable resources for recreational purposes deserves close examination by citizens and regulatory agencies. The importance of high-energy-demand outdoor recreation to our modern life style depends, to a large extent, upon individual values and priorities. Let's take a look at some.

One day, the following letter appeared in the paper:

Letter to the Editor of the Tallahassee Democrat removed to conform with copyright laws.

The next day, this letter appeared:

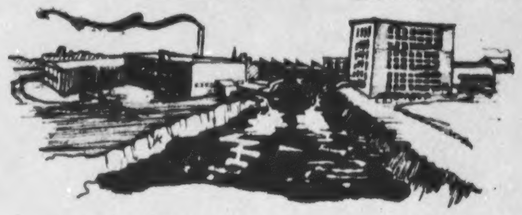
Letter to the Editor of the Tallahassee Democrat removed to conform with the copyright laws.

There seems to be some problems here! Discuss the two letters and try to identify the specific problems involved. Try to come up with as many kinds of solutions to each problem as you can.

## *SO WHAT*

Energy is an interesting strand to follow through any ecosystem. Learning about energy and discovering the environmental implications of energy use both ecologically and personally is what this booklet is about.

BUT DON'T CLOSE THIS BOOK without committing your personal life style to reduced energy consumption at home, at work, at school and at camp. The ideas and concepts and activities suggested here can be used in any of the environments in which you live. Try them, share them and write some of your own.



## Glossary of Energy Terms

BARREL. A unit of volume equal to 42 gallons or 5.61 cubic feet.

BTU (British Thermal Unit). A unit of energy equal to the energy required to raise the temperature of one pound of water 1° Fahrenheit.

COAL. A solid mineral, composed chiefly of carbon, of varying energy content and percentage of non-carbon materials including ash, moisture, and sulfur.

CRUDE OIL. Natural petroleum as it is produced from the earth, consisting primarily of hydrocarbon compounds.

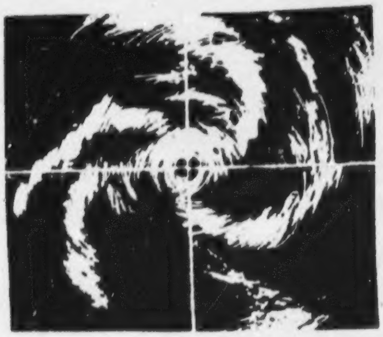
DIRECT ENERGY USE. Consumption of energy by the ultimate user directly for heating or production of mechanical energy rather than for conversion of energy to a different form.

DISTRIBUTION. An operation in the delivery of energy (usually electricity or natural gas) involving delivery to individual customers from a central point near the customers.

E.E.R. (Energy Efficiency Ratio). BTU/WATTS = E.E.R.

END USE. The ultimate purpose for which energy is consumed, such as space heating or private passenger conveyance.

ENERGY. The ability to do work. Energy exists in various forms, including electromagnetic, mechanical, and kinetic energy and heat. In this report energy is measured in British Thermal Units (BTU) or kilowatt-hours (KWH).



FOSSIL FUEL. The class of energy sources, including coal, petroleum, and natural gas, originating from organic material deposited during geologic history.

FUEL. Any material utilized as a source of energy.

HYDROELECTRIC ENERGY. Energy in the form of electricity produced from falling water.

INDIRECT ENERGY USE. Energy expended in conversion and delivery of energy to ultimate direct use. In Florida prime examples of indirect energy use are energy exhausted in electricity generation and natural gas consumed as pipeline pumping fuel.

KILOWATT (KW). A rate of generating or consuming electric energy. One kilowatt use of power equals 3,413 BTU per hour.

KILOWATT-HOUR (KWH). Energy equivalent of 3,413 BTU. Electricity generated or consumed at the rate of one kilowatt or 1,000 watts for one hour equals one kilowatt-hour.

NUCLEAR ENERGY. Energy released in the disintegration of atoms into lighter fragments.

PRIMARY ENERGY. Energy available directly from the original fuel, such as petroleum or natural gas, rather than from a secondary form such as electricity.

SECONDARY ENERGY. Energy in a form other than as originally produced, such as electricity produced from petroleum.

TRANSMISSION. Delivery of large quantities of energy (usually electricity or natural gas) from the point of original production to regional distribution points.

The Tallahassee Junior Museum was established in 1962 on a site outside the city near Lake Bradford to provide the community a learning center for early Florida's pioneer history and environmental studies. Most of the Museum's education programs have been youth-oriented (in 1972-73 over 26,000 school children visited the Museum), yet the exhibits, wildlife, pioneer farm and nature trails have a tremendous appeal for the entire community.

The fifty acre site preserves the natural flora and fauna. The nature trails meander over forty acres of flowers, open fields and forests. Large oaks provide a canopy of shade and boardwalks over cypress swamps hold a special fascination for visitors. Birds are seasonally abundant. Small mammals are kept in an animal compound where they are used for study. Other creatures like the white-tailed deer, bald eagle, black bear, and waterfowl are exhibited in large natural habitats which allow them relative freedom. The Museum plans to have most of its animal collections in natural habitats as funds become available.

The Museum's "Big Bend" pioneer farm is authentic. The buildings were built in the 1880s at Hosford, about forty miles west of Tallahassee. Only the smokehouse and the blacksmith shop were reconstructed--and then, old materials were used. The farm area is enclosed by a split rail stake-and-rider fence also moved from the original farm site. The farm animals are typical of those found in early Florida barnyards.

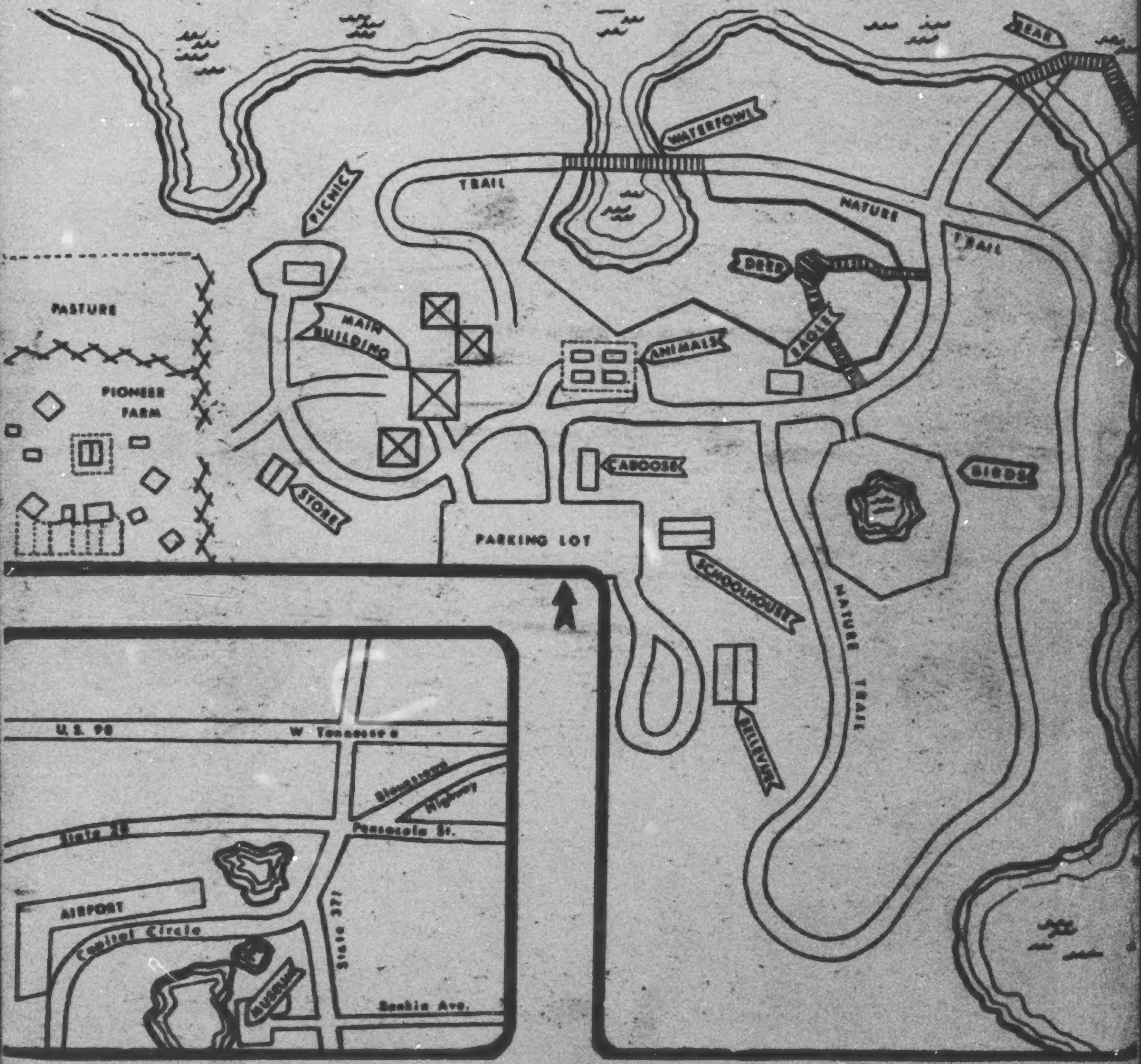
The main Museum buildings house changing exhibits on natural science, history, social sciences, art and music. The Natural Science Building features diaramas on birds, a bird viewing window, and the Museum's collection of live reptiles.

The Tallahassee Junior Museum is a tremendous community educational facility for the Tallahassee area and represents a substantial investment of time and capital by members of the community. At a time when the community is very concerned about environmental quality--demanding increased planning and protective ordinances--the museum offers the place and the resources for community-wide environmental awareness and education programs.

For additional information,
contact:

Sam W. Kates, Director
Tallahassee Junior Museum
3945 Museum Drive
Tallahassee, Florida 32304
(904) 576-1636

# tallahassee junior museum


BEAR
WATERFOWL
PICNIC
TRAIL
NATURE
TRAIL
DEER
EAGLE
MAIN BUILDING
ANIMALS
PASTURE
PIONEER FARM
CABOOSE
BIRDS
STORE
PARKING LOT
SCHOOLHOUSE
NATURE TRAIL
BELLEVUE
U.S. 90
W Tennessee
Blountstown Highway
State 20
Pensacola St.
AIRPORT
Capital Circle
State 371
MUSEUM
Rankin Ave.